THE DISASTER HANDBOOK

FOR

EXTENSION

AGENTS

UNIVERSITY OF WISCONSIN-EXTENSION • COOPERATIVE EXTENSION

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PUBLICATION ORDERING INFORMATION:

For Extension publications listed on fact sheets or a catalog of University of Wisconsin-Extension, Cooperative Extension publications, contact your county Extension office. There may be charges for the publication, postage and sales tax.
For publications of the Wisconsin Division of Emergency Government, including “Flood Awareness,” “Tornado Awareness,” “Winter Storm Awareness,” and “Fire Awareness,” write Wisconsin Division of Emergency Government, 2400 Wright Street, P.O. Box 7865, Madison, WI 53707-7865 or call (608) 242-3232.

For publications of the Federal Emergency Management Agency (FEMA) and the American Red Cross, including “Repairing Your Flooded Home,” “Your Family Disaster Plan,” and “Your Family Disaster Supplies Kit,” contact your local emergency government office, local chapter of the American Red Cross or write: FEMA, P.O. Box 70274, Washington, D.C. 20024, ATTN: Publications. (Single copy and catalog requests only)

For publications or publication catalogs of the Midwest Plan Service and Northeast Regional Agricultural Engineering Service, write: MWPS Secretary, Agricultural Engineering Department, 460 Henry Mall, University of Wisconsin, Madison, WI 53706 or call (608) 262-3311.

flood

Flood Preparedness and Response

STRATEGIES FOR FAMILIES

Floods are an inevitable and natural part of life in Wisconsin, especially for those who live along streams and rivers. Counties that border the Mississippi and the Wisconsin rivers are the most flood prone, but serious floods have occurred throughout the state. It is important to be prepared and know what to do before disaster strikes.

BE PREPARED

- *Find out if you live in a flood prone area.* If you are new to the area, ask your local public works or emergency government office about local flood history. Ask whether your property is above or below the flood stage water level.

- *If you live in a frequently flooded area, stockpile emergency building materials.* These include plywood, plastic sheeting, lumber, nails, hammer, saw, pry bar, shovels and sandbags.

- *Plan and practice an evacuation route.* Contact your local emergency government office or local American Red Cross chapter for a copy of the community flood evacuation plan. This plan should include information on the safest routes to shelters. Individuals living in flash flood areas should have several alternate routes to higher ground.

- *Have emergency supplies on hand.*

  a) Flashlights and extra batteries
  b) Portable battery-operated radio and extra batteries
  c) First-aid kit and manual; essential medicines
  d) Emergency food, water, cooking equipment, can opener
  e) Cash and credit cards

- *Develop an emergency communication plan.* In case family members are separated during a disaster because of work or school, choose a long-distance relative or friend who can serve as the “family contact.” After a disaster, it is often easier to call long-distance than to place a local call. Make sure everyone in the family knows the name, address and phone number of the contact person.

- *Make sure that all family members know how to respond after a flood or flash flood.* Teach family members how to turn off gas, electricity and water; local authorities may request that you do so during a flood. Teach children how and when to call 911, police and fire, and which radio station to tune to for emergency information.

- *Keep the car fueled.* Stations may not be able to operate because of lack of electricity.

- *Learn about the National Flood Insurance Program.* Most Wisconsin communities participate in this program, which offers residents flood insurance. (See the fact sheet “Insurance Coverage and Making a Claim.”) Regular homeowner's insurance does not cover flood damage.

AFTER A FLOOD

Don't return home until authorities have indicated it is safe. When entering buildings, use extreme caution. Potential hazards include:

♦ Gas leaks. Leave your home immediately and call the gas company if you smell the putrid odor of leaking gas. Lanterns, torches, electrical sparks and cigarettes could cause an explosive fire if there is a leak. Do not turn on any light switches.

♦ Electrocution. Wear rubber gloves and rubber-soled shoes to avoid electrocution. Do not turn on any lights or appliances if the house has been flooded. Turn off the electricity when checking electrical circuits and equipment or when checking a flooded basement.

♦ Structural damage. Watch for falling debris and the possibility of collapsing ceilings and basement walls.

♦ Food and water. Do not use water or eat food that has come in contact with floodwaters.

DURING A FLOOD

- *Listen to the radio for further information.*
- *Fill bathtubs, sinks and jugs with clean water in case water becomes contaminated.*
- *Bring outdoor belongings, such as patio furniture, indoors.*
- *Move valuable household possessions to the upper floors or to safe ground if time permits.*
- *If you are instructed by authorities, turn off all utilities at the main power switch and close the main gas valve.*
- *Join with neighbors and volunteers to put sandbags or other protection in place.* Stack sandbags away from the outside walls of houses to prevent floodwaters from entering.
- *Do not attempt to walk through moving floodwaters.* If they are moving fast enough, water one foot deep can sweep you off your feet.
- *Do not attempt to drive over a flooded road.* Turn around and go another way.

DURING AN EVACUATION

- *Listen to the radio for evacuation instructions.* If advised to evacuate, do so immediately. Evacuation is much simpler and safer before floodwaters become too deep for ordinary vehicles to drive through.
- *Follow recommended evacuation routes — shortcuts may be blocked.*

Additional resources:

Your local emergency government office, the American Red Cross, your county Extension office, the Wisconsin Division of Emergency Government, the Federal Emergency Management Agency

Related publications:

“Flood Awareness,” Wisconsin Division of Emergency Government, 1991.

Information from: University of Wisconsin Cooperative Extension, Federal Emergency Management Agency, Wisconsin Division of Emergency Government

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Preparing to Evacuate Your Farm

SAFETY MEASURES WHEN FLOODING IS EXPECTED

If you live in an area prone to flooding or if flooding has been anticipated for some time, have an emergency plan for evacuation. It should include such considerations as family safety, equipment safety, livestock relocation and temporary milking facilities.

When flooding is hours or minutes away, keep your priorities straight. Ensure family safety first. Be certain you have enough time to get to higher ground before access is cut off. If you have time before receiving an evacuation order, a number of precautions may help you protect your property and livestock.

LONG-RANGE PREPARATION

Take these precautions if flooding is common to your area or anticipated this season:

- Create an emergency plan of action, considering such things as areas of high ground for animal relocation, temporary milking facilities and approval to use them, equipment relocation and safe pesticide storage.
- Be sure cattle are properly immunized before being exposed to floodwaters.
- Arrange or be aware of standby services for emergency milk pick-up.
- Have a plan for moving grain out of reach of floodwaters.
- Provide riprap on banks of earthen manure storages where flowing water may erode berms.

SHORT-TERM PREPARATION

If time is available, take the following precautions:

- Move machinery, feed, grain, pesticides and herbicides to a higher elevation. If you have a two-story barn, the upper level makes a good temporary storage facility.
- Open gates so livestock can escape high water.
- If water is rising, try to drive stock through water free of obstructions. Grazing animals swim well, but the greatest problem for them are fences and other obstacles. Long swims through calm water are safer than short swims through a swift current.
- Leave building doors and windows open at least 2 inches to equalize pressure and help prevent buildings from shifting.
- If possible, move motors and portable electric equipment to a dry location.
- Disconnect electric power to all buildings which may be flooded. If in doubt about how to disconnect power, call your utility company.
- Tie down lumber, logs, irrigation pipes, fuel tanks and other loose equipment or material. Secondary containment is another possibility for fuel tanks, as well as pesticide storage.
- To keep surface water out of your well, use materials such as heavy plastic and duct tape to seal the well cap and top of the well casing.

Additional resources:

Weather-reporting services, such as the National Weather Service, to predict the severity of flooding; your county agricultural agent; your local emergency government office; the American Red Cross; the Federal Emergency Management Agency

Information from: University of Wisconsin Cooperative Extension, Pennsylvania State University Cooperative Extension

Pesticide Storage Concerns During a Flood

PREVENTION AND EMERGENCY RESPONSE

Safe pesticide storage is of critical importance in both everyday and disaster situations. Not only can improperly stored pesticides pose significant hazards to humans, but they can do great harm to the environment, including surface water and groundwater contamination. Combined with floodwaters, pesticides can create a widespread health problem by threatening drinking supplies.

For all of these reasons, take preventive measures to minimize storage quantities and potential exposure to floodwaters. Take extra precautions if you live in a floodplain or expect flooding. If flooding of pesticides occurs, be sure you follow safe, legal methods for emergency response, containment and clean-up.

PREVENTION

- *Choose a safe location.* If at all possible, locate pesticides in an area where flooding is not likely. A good location will be downwind and downhill from sensitive areas, such as homes and play areas, ponds or streams.

- *Update your pesticide storage design.* Contact your local Extension agent or the Midwest Plan Service for modern pesticide storage plans. Safety is a major criterion in new designs, as well as efficiency for farmers. Features may include a mixing and loading pad, a drainage system to collect contaminated runoff, a worker safety area and a separate area for your personal protective clothing and equipment.

- *Keep pesticide storage to a minimum.* The fewer pesticides on site, the less you have to worry about. Consider the following:

  a) Contract to have pesticides applied. This eliminates storage and most liability concerns.
  b) Clean out existing inventories. If a pesticide is still registered for use, give it to a producer who can legally use it. If it is no longer registered, dispose of it at a county Agricultural Clean Sweep program.
  c) Purchase only enough pesticide for a single season.

- *Take extra care with water-permeable containers.* Dry formulations packed in paper bags, fiber drums, cardboard boxes or similar containers should be stored on metal shelves. Do not store liquid pesticides on shelves above dry formulations.

- *If flooding is imminent, move pesticides (especially those in unsealed or water-permeable containers) to a higher storage location.* Use caution in moving containers — wear protective gear as necessary.

- *Develop an emergency response plan in case of a leak, spill or fire.* Because of hazardous substances on you farm, you may be required to develop a plan under the Superfund Amendments Reauthorization Act (SARA) Title III. SARA requires farmers who have any of 360 extremely hazardous substances at 500 pounds or the threshold planning quantity to alert the State Emergency Response Board (SERB) with a Planning Notification Fee Statement. An off-site plan identifying the substances and their location on the farm must be developed with final plan copies sent to the local fire department, your Local Emergency Planning Committee (LEPC) and SERB. Contact the Wisconsin Division of Emergency Government for more information.

WATCH FOR PESTICIDE POISONING

Be aware of any illness arising after handling pesticides or pesticide wastes. Acute symptoms of poisoning frequently include headache, nausea, diarrhea, visual disturbances, excessive salivation or sweating, difficulty in breathing, weakness, tremors or convulsions. Acute symptoms usually appear immediately or within a few hours after exposure. See a doctor immediately or contact your local poison control center if symptoms appear.

IF FLOODING HAS OCCURRED

If you suspect flooding of pesticide storage areas, use great caution in investigating the immediate area — floodwaters may be contaminated with pesticides. Wear appropriate protective clothing, particularly safety boots, to avoid exposure.

If a release of pesticides has occurred, you are required by the Wisconsin Spill Law to notify local and state authorities. Local authorities include your Local Emergency Planning Committee. You can meet state reporting requirements by calling the Wisconsin Division of Emergency Government Spill Hotline at (800) 943-0003. This hotline is available 24 hours a day, 7 days a week. The duty officer at the Spill Hotline or your LEPC can help you determine if federal notification is needed.

Emergency hotline personnel will gather information about the pesticide release and make response decisions. Emergency response professionals in your area will be notified to serve as the first responders to the flood site, as necessary. Some possible scenarios:

- *For minimal flooding or leakage from paper containers, officials may provide you with specific clean-up instructions.* For example, you may be asked to place the water-damaged pesticide into a secondary waste container and to dispose of it at the next Agricultural Clean Sweep event.

- *If moderate flooding has occurred, containment and clean-up may be feasible.* Area emergency response professionals may be sent to the site. Technical guidance from the DNR and the Wisconsin Department of Agriculture, Trade and Consumer Protection will be provided, as necessary.

- *If major flooding has already occurred, containment may be impossible and clean-up minimal.* Check your storage inventory to determine if product is missing. If so, inform your LEPC about types of pesticides and approximate amounts removed by floodwaters.

CONTAIN THE AREA

Take steps to prevent further release of the pesticides if possible and feasible. Put smaller containers that are leaking into larger containers. Wear protective clothing and equipment so you do not needlessly expose yourself to the material in the process of stopping the spill.

At the same time the leak is being controlled, contain the spill material to the area; if possible, construct a dam to prevent the chemical from spreading.

Additional resources:

Your local emergency government office, the Wisconsin Division of Emergency Government, your county agricultural agent

Related publications:

UW-Extension publication “Pest Management Principles for the Private Applicator.”

“SARA Fact Sheet for Farmers,” available from the Wisconsin Division of Emergency Government.

Information from: University of Wisconsin Cooperative Extension
University of Wisconsin-Extension • Cooperative Extension

Building Dikes to Prevent Flooding

HOW TO FILL AND POSITION SANDBAGS

Standing water from melting snow or heavy rains can flood basements and damage yards, wells, feed supplies, machinery and other property. Flooding is more apt to occur in areas with poor surface drainage, malfunctioning drainage systems or ice dams.

A 1- to 3-foot-high sandbag or earth dike offers protection from shallow flooding (water depth less than 3 feet). Contact a construction firm, lumberyard or your county emergency government office for information on where to obtain sandbags.

SITE SELECTION

Select the site for the dike, making the best use of natural land features to keep it as short and low as possible. Avoid trees or other obstructions which would weaken the structure. Do not build the dike against a basement wall. Leave about 8 feet of space to maneuver between the dike and buildings. Remove ice and snow, down to the bare ground if possible, from the strip of land you've selected.

SANDBAG NEEDS

The number of bags required for 100 linear feet of dike is as follows:

- 800 bags for 1-foot-high dike
- 2,000 bags for 2-foot-high dike
- 3,400 bags for 3- foot-high dike

FILLING AND POSITIONING SANDBAGS

See diagrams on the back side. If you are building the dike on a lawn you may omit the bonding trench shown in the diagram on Stacking Sandbags.

- Fill bags approximately half full of clay, silt or sand. Do not tie.
- Alternate direction of bags with bottom layer lengthwise of dike. Lap unfilled portion under next bag.
- Tamp thoroughly in place.
- Build the dike three times as wide as high. For example, if the height is 3 feet, make the base 9 feet.

SEALING THE DIKE

Seal the finished dike to increase its watertightness. To seal the dike:

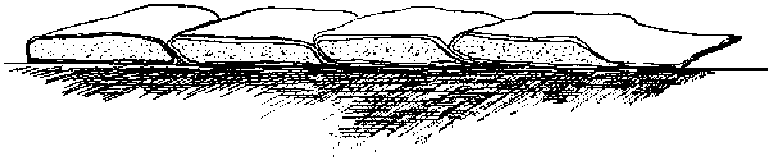
- Spread a layer of earth or sand 1 inch deep and about 1 foot wide along the bottom of the dike on the water side.
- Lay polyethylene plastic sheeting so the bottom edge extends 1 foot beyond the bottom edge of the dike over the loose dirt. The upper edge should extend over the top of the dike. This sheeting is available from construction supply firms, lumberyards and farm stores. It should be about 6 mils thick. It comes in 100-foot rolls and is 8 or 10 feet wide.

- Lay the plastic sheeting down very loosely. The pressure of the water will then make the plastic conform easily with the sandbag surface. If the plastic is stretched too tightly, the water force could puncture it.

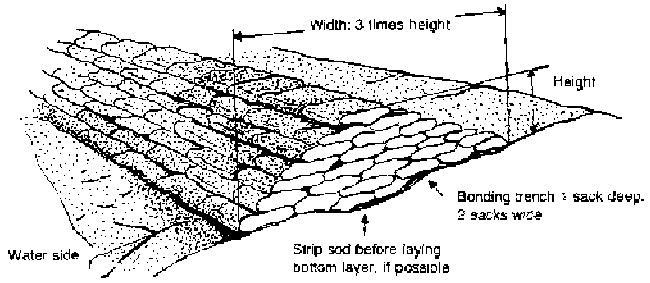
- Place a row of tightly fitting sandbags on the bottom edge of the plastic to form a watertight seal along the water side.

- Place sandbags at about 6 foot intervals to hold down the top edge of the plastic. Place boards or dirt between these sandbags to prevent winds from disturbing the plastic. As you work, avoid puncturing the plastic with sharp objects or by walking on it.

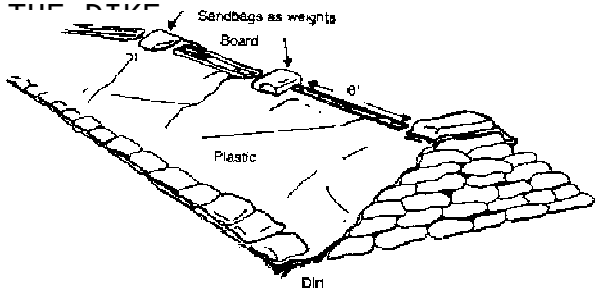
HOW TO FILL AND LAP SANDBAGS



STACKING SANDBAGS



SEALING THE DIKE



Additional resources:

Your local emergency government office, your county agricultural agent, the American Red Cross, the Federal Emergency Management Agency

Information from: University of Wisconsin Cooperative Extension, Pennsylvania State University Cooperative Extension Service

Protecting Livestock During a Flood

GUIDELINES FOR SAFE SHELTER AND EVACUATION

Unconfined livestock can usually take care of themselves during floods. Do not let them become trapped in low-lying pens. A number of safety precautions, as outlined at right, can be taken for animals housed in barns during a flood. Above all, be sure animals are evacuated before floodwaters enter barns and other enclosed livestock areas. Animals sometimes refuse to leave during a rapid rise of water and may drown.

KEEPING LIVESTOCK HIGH AND DRY

In broad, level flood plains where floodwaters are seldom deeper than 3 or 4 feet, you may need to construct mounds of soil on which livestock can stay until floodwaters recede. Try to locate the mounds where they will not be washed away by fast-flowing water.

THINK ESSENTIALS, SAFETY IN BARNS

- *Provide feed and water.* Water is essential. Thirsty animals will try to break out to get to floodwaters. If clean water is in short supply, limit feed intake.
- *If animals are housed with machinery, fasten bales of straw in front of sharp edges and protruding parts such as cutter bars or crank handles.* (Do not use hay, because animals will eat it.) Try to cover wooden paddle wheels on combines or choppers, since these parts can be dangerous.
- *Block off narrow passageways* where animals would be unable to turn around. A few heavy animals in a narrow dead end can be dangerous both to themselves and the building.
- *Be absolutely certain that herbicides, pesticides and treated seeds are not even remotely accessible to livestock,* and are stored where floodwater will not contaminate livestock feed or water.
- *Turn off electricity* at the main switch. Livestock could damage electric fixtures, causing fires or electrocutions.
- *If there is a possibility that dairy barns may become inundated, drive cattle out of the barn.* During rapid rise of water, cattle often refuse to leave the barn and may drown inside if the water rises high enough. For this reason, begin evacuation measures before a state of emergency.

Additional resources:

Weather-reporting services, such as the National Weather Service, to predict the severity of flooding; your local emergency government office; your county agricultural agent

Information from: University of Wisconsin Cooperative Extension, Pennsylvania State University Cooperative Extension Service
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Standby Electric Generators

A SOURCE OF EMERGENCY POWER FOR FARMERS

An emergency source of power is important for any farm with mechanically ventilated production facilities, bulk milk handling equipment, mechanical feeding equipment or facilities requiring constant and continuous heat (such as brooders). On such a farm, a standby electric generator is a good investment, possibly preventing costly losses during a power failure.

During disasters such as flood or tornado, relief agencies may provide generators to farmers on an emergency basis.

TYPES OF GENERATORS

Standby generators are either engine driven or tractor driven. Either type can be stationary or portable. Engine driven units can be either manual or automatic start. Gasoline-, LP gas- (bottled gas) and diesel-fueled engines are available.

Generators must provide the same type of power at the same voltage and frequency as that supplied by power lines. This is usually 120/240 volt, single phase, 60 cycle alternating current (AC). An air-cooled engine is often used for generators up to 15 kilowatts. A liquid-cooled engine is necessary for generators larger than 15 kilowatts. Engine capacity of 2 to 2 1/4 hp with the proper drive system must be available for each 1,000 watts of generator output.

SIZE OF GENERATORS

A full-load system will handle the entire farmstead load. Automatic engine-powered, full-load systems will begin to furnish power immediately, or up to 30 seconds after power is off. Smaller and less expensive part-load systems may be enough to handle essential equipment during an emergency.

Power-take-off (PTO) generators are about half as costly as engine-operated units. Under a part-load system, only the most essential equipment is operated at one time. For most farms, this type of system is adequate, provided the generator is sized to start the largest motor. For example, the milk cooler or ventilation fan would need to be operated continuously, but the operation of the silo unloader and mechanical feeding system could be postponed until the milking chores are completed. PTO units can be mounted on a trailer.

INSTALLATION

Wiring and equipment must be installed in accordance with the National Electrical Code, local ordinances and the requirements of your power supplier. It is essential that you have the proper equipment for disconnecting the generator from public utility lines. Most companies require the installation of a double-pole double-throw transfer switch or its equivalent for this purpose. Check with your electrician or power supply representative for installation, installation instructions and inspection.

LOCATION AND SAFETY FEATURES

- Large engine generators should be located in a building, preferably a heated building.
- Inlet and outlet air ducts must be large enough to carry off excess heat. They should be open at least a half a square foot for each 1,000 watts of generator capacity.
- Combustion fumes must be carried outdoors safely. Exhaust pipes must be at least 6 inches from combustible material.

OPERATION

An automatic standby unit should start automatically when power fails, and stop when power is restored. When using an engine-driven generator with a manual start, or when using a tractor driven unit, follow this procedure when power fails:

- Call your power supplier and advise them of the conditions.
- Turn off or disconnect all electrical equipment.
- Position the tractor or engine for belt of PTO drive.
- Start the unit and bring the generator up to proper speed (1,800 or 3,600 rps). Check on arrangement to carry off exhaust fumes. Be sure there is no danger of fire. The voltmeter will indicate when the generator is ready to carry the load.
- Put the transfer switch in the generator position.
- Start the largest electrical motor first, adding other loads when each is up to operating speed. Do not add too much too fast. If the generator cuts out for any reason, repeat the second, third and fourth steps above.
- Check the voltmeter frequently. If voltage falls below 200 volts for 240 volt service or below 100 volts for 120 volt service, reduce the load on the generator by turning off some electrical equipment.
- When commercial power is restored, put the transfer switch in normal power position. Then stop the standby unit.

MAINTENANCE

- Keep the unit clean and in good running order at all times so it will be ready for immediate use. Dust and dirt accumulations on the motor can cause it to overheat when operated.
- Follow maintenance instructions in manufacturer's manual. A short operation at set intervals will keep the engine in good operating condition. Regularly scheduled warm-ups are necessary to keep a standby engine in working order.

Additional resources:

Your county agricultural agent

Related publications:

UW-Extension publications–

“Standby Electric Power Equipment for the Farm and Home,” (AF2273);

“Electrical Systems for Agricultural Buildings,” (checklist), (A8NE846);

“Electrical Systems for Agricultural Buildings,” (recommended practices), (A8NE845).

“Standby Power,” Illinois Farm Electrification Council, Fact Sheet #2.

Information from: University of Wisconsin Cooperative Extension, Pennsylvania State University Cooperative Extension Service
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Avoiding Groundwater Damage to Homes

REMEDIES FOR HOMEOWNERS

Groundwater flooding can cause many problems for homeowners. Structural damage, sewer system back-ups and damaged appliances are three of the most distressing consequences. Fortunately, there are some remedies. They vary in scope, expense and results, just as homeowners vary in their expectations and resources.

CONSIDER YOUR RESOURCES

Sound advice should be your first priority when groundwater flooding is a problem. Expertise can come from a variety of sources.

- *Local resources* include your local emergency government office, building inspectors, insurance agents (if you have appropriate insurance), county Extension agents and the Home Builders Association. All have access to technical assistance, publications and possible sources of financial aid.

- *Financial assistance* may be available through your local emergency government office. This may also include temporary housing and crisis counseling.

    a) Grants and low-interest loans may be available in cases of regional disasters.
    b) Check with your insurance agent to determine whether your homeowner's insurance covers any of the damages. Groundwater, surface water and floodwater damages usually are not covered by homeowner's insurance. Your agent may have a rider available for groundwater flooding. Homes located in floodplains subject to surface water flooding are eligible for federal flood insurance.

- *Contractors* can help you determine the nature and extent of your damages and what remediation options are appropriate for your situation.

    a) A waterproofing contractor may be able to correct the problem if you simply need to stop minor nuisance flooding.
    b) A general contractor may be necessary if you have damages to your home and need more substantial repairs and corrective measures. General contractors can arrange for the services of various specialists. (See the fact sheet, "Hiring a Contractor After a Disaster," for more information.)

YOUR OPTIONS

The severity and frequency of groundwater flooding will in part dictate the best solution. The following options parallel increasing severity of groundwater flooding:

- *Raising appliances, furniture and fixtures.* In cases where groundwater flooding is a minor nuisance that amounts to little more than wet walls and small streams across the basement floor to a drain, solutions may include:

a) *Raising or blocking up appliances, furniture and other items that may be damaged by direct contact with the water for an extended time;*
b) *Installing a false floor over the basement slab. This allows water to drain under the false floor to a drain or sump.*
c) *Installing a surface drainage system around the perimeter of the basement floor. This method channels water from the walls to a drain or sump for removal.*

- *Relieving water pressure against walls and the floor*. Some form of drainage is necessary when cracks occur because of water pressure.

  a) If the basement or foundation does not already have drain tile installed, consider an excavation of the home exterior to allow for waterproofing of the walls and the installation of washed stone (gravel) and drain tile. Drain tile can divert water away from the house if there is a slope, or accommodate a sump pump system as noted below.
  b) Internal drainage is another option if excavation is not possible or convenient. Washed stone and drain tile are installed around the interior perimeter of the basement footing. This requires subfloor installation and trenching.
  c) Sump pumps are a necessary part of the internal drainage system unless the interior tile can be connected to exterior tile that will drain away from the house. Similarly, sump pumps may be a necessary part of external drain tile systems if water does not drain away from the house naturally.

- *Filling the basement.* This option can eliminate the groundwater problem, but the trade-off is the loss of a full basement. If the groundwater level in a basement is only 1 or 2 feet, one option is to pour a new floor in at a higher level, leaving a crawl space in the basement. The original floor needs to be broken first, so that water pressure can be relieved. Fill dirt is brought in and the new floor poured. Drainage under the new floor also is recommended. In more severe cases, the basement may have to be completely abandoned.

- *Rebuilding septic systems and wells.* If septic systems and wells have been compromised, the systems should be rebuilt following modern guidelines for high groundwater areas. There may be added expenses related to closing or removing portions of existing systems that have failed.

- *Raising or relocating the house*. This is the most expensive option. It is the best long-term solution when the building integrity is threatened and utilities must be shut off. In some cases, it may be the only reason-able option to avoid property damages and lower property values.

Additional resources:

Your county Extension office, your local emergency government office, building inspectors, insurance agents (if you have appropriate insurance), the Home Builders Association, the Federal Emergency Management Agency

Related publications:

UW-Extension publications–

"Removing Ground Water From a Basement of an Existing Home," December 1993;

"Hiring a Contractor After a Natural Disaster," December 1993.

"Repairing Your Flooded Home," the American Red Cross/Federal Emergency Management Agency, 1992.

"Retrofitting Flood-Prone Residential Structures," Federal Emergency Management Agency, 1986.

Cleaning and Repairing Flooded Basements

GETTING OUT WATER AND PREVENTING FUTURE PROBLEMS

Before you enter a flooded basement, take time to:

1) Turn off the electricity, preferably at the meter;

2) Check outside cellar walls for possible cave-ins, evidence of structural damage or other hazards;

3) Turn off gas or fuel service valves; and

4) Open doors and windows or use blowers to force fresh air into the basement.

PUMPING

For safety reasons, do not use an electric pump powered by your own electrical system. Instead, use a gas-powered pump or one connected to an outside line. Fire departments in some communities may help with pumping services.

More damage may be done by pumping flooded basements too soon or too quickly. Water in the basement helps brace the walls against the extra pressure of water-logged soil outside. If water is pumped out too soon, walls may be pushed in or floors pushed up. To help prevent this kind of structural damage:

- Remove about a third of the water each day. Watch for signs of structural failing.
- If the outside water level rises again after the day's pumping, start at the new water line.
- Don't rush the pumping; the soil may be very slow to drain. Whatever is submerged in the basement will not be damaged further by delaying the pumping.

CLEANING

After water has been pumped from the basement, shovel out the mud and debris while it is still moist. Hose down walls to remove as much silt as possible before it dries. Floors and walls may need sanitizing, particularly if sewage has entered the basement. Scrub walls and floors with a disinfecting solution of 1 cup chlorine bleach per gallon of water.

Oil stains caused by overturned or damaged oil tanks also may be a problem following basement flooding. Commercial products, available from fuel-oil suppliers, will help neutralize fuel oil. The products come in powder form or an aerosol spray for hard-to-reach places. To remove oil stains and destroy odor: wipe up excess oil, shake or spray product on the spot according to manufacturer's directions, let it set, then sweep it up.

INSPECTION AND REPAIR

Before beginning repairs, make a thorough inspection of supporting columns, beams, walls and floors. Unless you have structural expertise, hire a contractor to make a professional survey. (Consider joining with neighbors for a group-rate inspection.) Repairs may extend to the following:

- *Buckled walls.* Signs of buckling include horizontal cracking and areas that have moved out of vertical alignment. When this condition is minor, you need not repair the wall immediately. However, any noticeably buckled wall will eventually collapse from normal ground pressures and seasonal temperature changes. When buckling has seriously weakened the wall, the damaged parts should be rebuilt immediately. Pilasters (vertical reinforcements) may need to be constructed into walls over 15 feet long.

- *Settled walls and footings* are indicated by vertical cracks either in small areas or throughout the structure. Repairs are difficult without special equipment. Contact a reliable contractor for this work.

- *Heaved floors* are those that have not returned to their original level or have cracked badly. The floor may have to be removed and a new floor constructed. If a floor is badly cracked, but has returned to its original level, a new floor may be placed over the old one. A vapor barrier should be added between the two floors. The new floor should be at least 2 inches thick.

In houses without basements, the area below the floor may be completely filled with mud. Shovel out the mud as soon as possible to avoid rotting joists or foundation wood.

Additional resources:

Your county family living agent, your local emergency government office, the American Red Cross, the Federal Emergency Management Agency

Related publications:

"Repairing Your Flooded Home," the American Red Cross/Federal Emergency

Information from: University of Wisconsin Cooperative Extension, Pennsylvania State University Cooperative Extension Service, University of Missouri Extension

Home Clean-Up and Sanitation

SAFELY CLEANING A FLOOD-DAMAGED HOME

Clean-up priorities will vary depending upon the kind and seriousness of damage to your home. But assuming major concerns such as structural safety, basement flooding, and electrical and water systems have been addressed, clean-up can begin inside.

Start cleaning your furnishings as soon as possible. Your aim should be to thoroughly dry and clean the house before trying to live in it or have permanent repairs made. Early efforts should include taking furniture, rugs, bedding and clothing outside to dry and prevent mildew.

SET PRIORITIES AND KEEP SAFETY IN MIND

As you begin clean-up, focus on accomplishing the most important tasks first. Resist over-exerting yourself.

- Give special attention to cleaning children's toys, cribs, playpens and play equipment. Boil any items a toddler or baby might put in his or her mouth. Discard stuffed toys, water-logged toys and non-cleanable items.
- Keep chemicals used for disinfecting and poisons used for insect and rodent control out of children's reach.
- Wear protective clothing on legs, arms, feet and hands while cleaning up debris.

GENERAL RULES FOR CLEANING AND DISINFECTING

- Wash exposed skin frequently in purified water. Wear rubber gloves to protect against contamination and skin irritation.
- Try using a pump-up garden sprayer or hose to remove layers of mud from hard surfaces.
- Scrub with a household cleaner/detergent solution and a brush to remove remaining surface oil. Rinse with clean water.
- Wash with a disinfectant, such as chlorine bleach, pine oil or a phenolic product, such as Lysol. Remember, a product is considered to be a “disinfectant” only if it is labeled as such. Rinse well.
- Dry items thoroughly to prevent mildew growth.
- Sanitize dishes, cooking utensils and food preparation areas before using them (see fact sheet, “Disinfecting Dishes, Cookware and Utensils”).

REMOVING MOLD AND MILDEW

- Brush off mold and mildew growth on household items outdoors to prevent scattering of spores in the house.
- Vacuum floors, ceilings and walls to remove mildew. Then wash surfaces with a detergent/household cleaner and water solution.

- Wipe mildew-stained areas with a cloth dampened with a solution of 1 cup of chlorine bleach or rubbing or denatured alcohol to 1 gallon water. Pine-based or phenolic products also work well.

PREVENTING MILDEW GROWTH

- Use an air conditioner, dehumidifier or heater, if available, to remove moisture. Use fans to circulate air and open all windows.
- Turn on electric lights in closets and leave doors open to dry the dampness and humidity.
- Spray with a fungicide or other mildew preventive product. Read and follow instructions and precautions on product label. Dry thoroughly.

Additional resources:

Your county family living agent, your local emergency government office, the American Red Cross, the Federal Emergency Management Agency

Related publications:

"Repairing Your Flooded Home," the American Red Cross/Federal Emergency Management Agency, 1992.

Information from: University of Wisconsin Cooperative Extension, Illinois Cooperative Extension Service, Pennsylvania State University Cooperative Extension Service

Electrical Systems and Appliances

GENERAL CLEAN-UP AND WHAT TO DO BEFORE THE ELECTRICIAN ARRIVES

Restoring the electrical system and evaluating damage to appliances are high priorities after a flood. But before your electrical system is turned on, it should be thoroughly checked for short circuits by an electrician or other competent person. Ask your power supplier for advice and assistance.

Before entering your home after the flood, be sure that the electricity has been completely shut off. Appliances should not be operated until they have been thoroughly cleaned and reconditioned. Running equipment before it is properly cleaned could seriously damage it and may cause electrical shock.

ELECTRICAL CIRCUITS AND EQUIPMENT

Things to do before the electrician arrives:

- Have electricity shut off at both the meter and in the buildings. When touching switches, stand on a dry board and use a dry stick or rubber gloves to pull handles.
- Remove covers from all switches, convenience outlets, light outlets and junction boxes that have been under water.
- If a box is filled with mud, remove the screws that hold the receptacle or the switch in place. Pull receptacle, switch and wires out about two inches from box. Clean out all mud and dirt. Do not remove electrical connections. Leave boxes open for electrician.
- Remove all fuses and covers from entrance panel. Clean out all mud. Wires can be moved, but *do not disconnect.*

For some equipment, such as pumps, a temporary line can be installed by an electrician until the permanent wiring has a chance to dry.

ELECTRICAL APPLIANCES

Here are some general rules to follow:

- *Television sets and radios.* Professional cleaning is recommended for these types of appliances. There is a danger of shock because certain internal parts can store electricity even when the appliance is unplugged. Check the back for a warning label. Get a cost estimate before repairs to see if the appliance is worth saving.
- *Motorized appliances.* These include the washing machine, dryer, dishwasher and vacuum cleaner. Professional cleaning of the motor and other parts is recommended. However, you can clean the exterior surfaces in the meantime.

    a) Use a heavy-duty cleaner and hot water to remove stains and silt deposits. Follow up with a rinse solution of 2 tablespoons chlorine bleach to each quart of water.
    b) When removing gritty deposits, rinse your cloth in water frequently to avoid scratching enamel or metal surfaces.
    c) Clean and disinfect dishwashers, washing machines and dryers only with water that has been declared safe to drink.

- *Refrigerators, freezers and ovens.* These appliances may have foam insulation and sealed components that suffer little water damage. But since they hold food, they should be cleaned, disinfected and checked by a professional or replaced. If replacement is recommended, get the opinion in writing and discuss it with your insurance adjuster before money is spent for a new appliance.

- *Heating appliances.* Disconnect hot water heaters and remove all panels and any flood-soaked insulation. Have an electrician or professional repair person clean and restore the unit to working order.

- *Lights and lamps.* Remove fixtures that were submerged. Clean outlet boxes, sockets and wiring. Floor or table lamps should be completely disassembled and cleaned. Damaged cords and plugs should be replaced. Consider taking lamps to an appliance shop unless you are familiar with these repairs.

GROUNDING

All metallic appliances that have been flooded should be properly grounded to prevent electric shock. Mud or dirt in a grounded outlet or adapter may prevent the grounding system from working, and you could be electrocuted. If you are unsure if your electrical system is properly grounded, call an electrician.

Additional resources:

Your county family living agent, your local emergency government office, the American Red Cross, the Federal Emergency Management Agency

Related publications:

"Repairing Your Flooded Home," the American Red Cross/Federal Emergency Management Agency, 1992.

Information from: University of Wisconsin Cooperative Extension, Florida Cooperative Extension Service, Iowa State University Extension, American Red Cross/Federal Emergency Management Agency

Restoring Heating Systems After a Flood

ASSESSING DAMAGE AND GENERAL CLEAN-UP

Any heating system exposed to flooding should be professionally inspected, cleaned and reconditioned before reuse. Floodwater may have damaged heating equipment and undermined chimneys. If chimney cracks or leaks go unrepaired, your family is at risk of fire or carbon-monoxide poisoning.

Ask the service person if there is anything you can do to help before his or her arrival. Usually this will include turning off fuel and power to flooded units as a safety measure, and removing mud and debris from the furnace housing and inside the chimney. Leave things like inspection of oil storage tanks and cleaning of motors, blowers and other flooded parts to the professional. Flood insurance and federal disaster assistance programs usually will help replace flooded gas and oil appliances, including furnaces.

OIL AND GAS SYSTEMS

In general, any flooded parts should be professionally inspected and cleaned before turning the system back on. Check your owner's manual if you are unfamiliar with the system.

- If your furnace was flooded to the level of the burners, turn off the valve on the pipe leading to it. If burners were hot when flooded, parts may have cracked.
- Modern furnaces also have an electrical switch for blowers. Turn this off as well if any furnace parts were flooded.

OIL-BURNING SYSTEMS

- Have the storage tank inspected by an experienced person to make sure water and dirt have not entered.
- Have the electric motor, burners, blowers, fuel pump and gears cleaned and reconditioned by an expert. Flooded fuel filters should be replaced.
- Be certain that the fan motor, electric ignition systems and wiring are completely clean and dry before you turn on the electricity.
- If you have a hot water system, clean the fins on baseboard radiators. Clean any wall radiators.

LIQUID PETROLEUM AND NATURAL GAS SYSTEMS

- Some natural gas systems may have a valve to the pilot gas line, in addition to the main fuel valve. Turn both off if this is the case.
- Have a service person:

  a) Check to see if water leaked into the controls or pressure regulator.
  b) Clean and recondition all flooded equipment, including burner elements, electric controls and regulators.
  c) Replace severely flooded electric blower motors.

- If you smell natural gas — which has a distinctive, putrid odor — leave your home and contact your utility company or a service person. Do not use open flames in the area.

ELECTRIC SYSTEM

Electric heating systems are part of electrical wiring system clean-up. Many local codes require that a licensed electrician do the work, or that a municipal inspector check the system before you turn the power back on.

If power isn't shut off to a flooded furnace system, shut the main switch off at the meter or remove the fuse to the furnace. (When touching switches, stand on a dry board and use rubber gloves or a dry stick to pull handles.)

Clean mud and debris from electric baseboard heating fixtures, being careful not to damage heating equipment. Have a professional handle cleaning and reconditioning of all working parts.

CHIMNEYS

A cracked, clogged or leaky chimney can cause fires or carbon monoxide poisoning. Be sure you check your chimney for dirt, debris and leaks before lighting the furnace or a fire. If flood damage has occurred, have a mason do an inspection and make repairs.

- Most chimneys have a foundation in the ground. If the chimney looks like it has settled or tilted, examine the footing to see whether it has been undermined.
- Have the chimney rebuilt if it has settled badly or is broken where it passes through floors or roof.
- If mortar in the joints between bricks has disintegrated, have a mason rejoint the chimney with cement.

Additional resources:

Your county family living agent, your local emergency government office, the American Red Cross, the Federal Emergency Management Agency

Related publications:

“Repairing Your Flooded Home,” American Red Cross/Federal Emergency Management Agency, 1992.

Pamphlets on heating systems from your local utility company.

Information from: University of Wisconsin Cooperative Extension, the American Red Cross, the Federal Emergency Management Agency

Flood-Damaged Walls, Ceilings and Floors

REMOVING MOISTURE, CLEANING AND REPAIRING

GETTING THE MOISTURE OUT

Be prepared to let flood-damaged walls, ceilings and floors dry for several weeks. If restoration work is completed before proper drying, mold and mildew will continue to grow. The result may be structural damage to your home, the need to repaint walls or replace new wall coverings, and discomfort or illness to family members who have allergies.

Remove all water as soon as possible from your home. Also remove furnishings that are water soaked. Once water is removed, the next step is removing moisture that has been absorbed by wood, plaster and other materials.

If the weather permits, open doors and windows to remove moisture and odors. If the outside humidity becomes greater than inside, close things up; likewise, close up the house overnight if temperatures drop and moist air might otherwise be drawn indoors. If windows are stuck tight, take off window strips and remove entire sash. If doors are stuck, drive out door hinge pins with a screwdriver and hammer, then remove.

Consider using dehumidifiers to speed up drying when outside humidity levels are high. If possible, rent commercial dehumidifiers, which remove three to four times more water than home models. When using dehumidifiers, shut windows and doors. If there is severe flooding in your home, consider hiring a contractor for water removal. Some companies can dry homes in less than a week with commercial dehumidifiers and air movers.

WALLS and CEILINGS

Wash out mud, dirt and debris as soon as possible with a hose and mop cloth or sponge.

Start cleaning from the top floor or upper limit of flooding and work downward.

Remove wallboard, plaster and paneling to at least the flood level. Wallboard acts like a sponge when wet. If soaked by contaminated floodwater, it can be a permanent health hazard and should be removed. If most of the wallboard was soaked by clean rainwater, consider cutting a 4- to 12-inch-high section from the bottom and top of walls. This creates a “chimney effect” of air movement for faster drying. A reciprocating saw with a metal cutting blade works well, but use only the tip of the blade and watch out for pipes, ductwork and wiring.

Plaster usually does not need to be replaced, though it will take a very long time to dry.

Some paneling may be salvaged if allowed to dry slowly. You also should remove and dispose of any flood-damaged insulation, which will hold water for months after getting wet.

REMOVING MILDEW

To remove surface mildew on walls or ceilings, use a mildew surface cleaner (available at paint stores) or: scrub the mildew with household detergent, then scrub with a solution of one-quarter cup bleach to 1 quart water. Rinse well with clean water. Once fully dry, apply a coat of paint containing an anti-mildew agent.

To remove surface mildew on floors and woodwork, use a phosphate cleaning solution such as powdered automatic dishwashing detergent or trisodium phosphate (4 to 6 tablespoons to a gallon of water), available in hardware stores. Rinse with water, and when dry, apply a mildew-resistant finish.

To clean surfaces:

- Thoroughly wash and disinfect walls, ceilings, exposed wall cavities and studs.
- Use a good disinfectant to prevent mildew build-up. One cup of chlorine bleach mixed with a gallon of water works well. For a soapier cleaning solution, add a half cup of mild detergent. Wear rubber gloves.
- If walls have already dried, work from the floor to the ceiling to prevent streaking. (Dirty water splashed on dry walls may be absorbed and become almost impossible to remove.) Overlap sections, cleaning the ceiling last.

FLOORS

Before the house has dried out, scrub floors and woodwork with a stiff brush, plenty of water, a detergent and disinfectant. Carpeting soaked by contaminated floodwater should be removed and discarded unless it can be sanitized at a commercial facility for a cost substantially less than replacement. Vinyl flooring and floor tile may need to be removed to allow drying of subfloor.

Wooden floors should be dried gradually. Sudden drying could cause cracking or splitting. Some restoration companies can accelerate drying time by forcing air through the fluted underside of hardwood floorboards.

ONCE FLOORS HAVE DRIED

Assess whether your floors can be repaired, replaced or recovered. Consider your time and budget as you make any decisions. If hardwood floors are damaged beyond repair, you may want to forego the cost of replacement and instead cover them with carpeting, vinyl or linoleum. Or you might lay a new floor over the old, rather than replace it.

- Plywood subfloors may have delaminated (separated) from excessive moisture, causing buckling. Sections may have to be replaced or have new plywood nailed over them. Consult a contractor for this work.
- If buckling or warping has occurred, drive nails where the floor tends to lift or bulge. This will prevent further damage. Badly warped hardwood floors usually can't be repaired. Warped, wide pine board flooring, however, will often flatten out after it has thoroughly dried.
- Plane or sand floors level. Do not refinish until thoroughly dry.

Additional resources:

Your county family living agent, your local emergency government office, the American Red Cross, the Federal Emergency Management Agency

Related publications:

“Repairing Your Flooded Home,” American Red Cross/Federal Emergency Management Agency, 1992.

UW-Extension Publications–

“Removing Water From the Building Materials of a Water Damaged Home;”

“High Humidity After Water Damage and the Growth of Mildew and Mites.”

Information from: University of Wisconsin Cooperative Extension, Pennsylvania State University Cooperative Extension Service, University of Missouri Extension

Drying and Repairing Walls

REMEDIES FOR INTERIOR AND EXTERIOR SURFACES

Walls must be dry from the inside out before restoration, repainting or recovering can begin. Even when walls feel dry to the touch, the material inside the wall may be wet. Drying the inside of the walls may take weeks or even months. The total drying time will depend partially on the amount of dry air that can circulate through the studding and different wall materials.

Plaster and paneling can often be saved, but you still need to get air circulating in the wall cavities to dry the studs and sills. Wallboard soaked by dirty floodwater will need to be replaced. If the wallboard was damaged by clean rainwater, consider cutting a 4- to 12-inch-high section from the bottom and top of walls. This will create a "chimney effect" to speed up drying time. A reciprocating saw with a metal cutting blade works well for this task, but use only the tip of the blade and watch out for pipes, ductwork and wiring.

GUIDELINES FOR WALL COVERINGS AND INSULATION

- Remove drywall, laminated paneling and plaster at least to the flood level. Warping above the water level often occurs with drywall and paneling, so more may need to be removed.
- Plaster walls can sometimes be adequately drained by removing the baseboard and breaking out plaster and lath at the bottom of the wall. Later the baseboard can cover the opening.
- Some paneling may be salvaged if allowed to dry slowly. Remove the baseboard from paneled walls and pry off the individual sheets. Prop them against the wall to dry. Don't allow them to dry in sunlight, which may cause warping.
- Remove vinyl-covered wallpaper. It will restrict drying within flood-damaged walls.
- Water-soaked insulation should be removed and replaced. It can hold water for months, causing odor and decay problems. While wet it has little insulation value.
- Consider wainscoting as a restoration option if flooding is no higher than 3 feet above the floor.

PATCHING PLASTER

Do not attempt to repair plaster until walls and inner walls (studding and insulation) are completely dry. If walls were flooded extensively, you may need to wait four to six weeks, or even several months, before attempting repairs.

Drywall compound is the preferred method for patching plaster. It comes in a variety of types with different drying times, shrinkage characteristics and consistencies. Read labels to select the type you need.

REPAIRING EXTERIOR SIDING

- Dry wall cavities from the inside if possible. (See previous section.)
- Remove small section of siding to check conditions on the reverse side. If crevasses are filled with silt, remove siding to water level and clean. Silt left in crevasses will trap moisture, causing mold, decay and peeling paint.

- Check for cracked or warped siding. If only a few boards are warped or cracked, replace them individually.

CHECKING SHEATHING

Sheathing is the material between studding and finish siding. Depending upon the type of sheathing, replacement may or may not be necessary.

- Wooden boards should dry slowly and some will warp. Re-nail warped areas after they dry. Replace those that are too badly warped to salvage.

- Sheathing board is usually absorbent and difficult to dry. Replace any that is disintegrating or separating.

- Plywood will probably separate and must be replaced. Marine plywood will not warp or separate, but is generally considered too expensive to use in residential construction unless the building is subject to frequent flooding.

Additional resources:

Your county family living agent, your local emergency government office, the American Red Cross, the Federal Emergency Management Agency

Related publications:

"Removing Water From the Building Materials of a Water-Damaged Home," University of Wisconsin-Extension, Madison, 1994.

"Repairing Your Flooded Home," American Red Cross/Federal Emergency Management Agency, 1992.

TIPS on Repairing or Rebuilding Your Disaster-Damaged Home, FEMA, 1981.

Information from: University of Wisconsin Cooperative Extension, Pennsylvania State University Cooperative Extension Service, University of Minnesota Extension Service, University of Missouri Extension

Assessing and Repairing Leaky Roofs

SAFELY FIXING A WATERY PROBLEM

You may be anxious to stop a roof from leaking, but don't risk serious injury trying to inspect or repair it. First, try binoculars for a closer view. Next, check the attic for a drip trail. Leaks are rarely located directly above the water spot on the ceiling. When you find a leak in the attic, push a nail, straw or wire through it to help you or a repair person locate it outside.

If rain continues to be a problem and a repair person is unavailable, follow the directions at right for temporary relief. But be sure that only a physically able person gets on the roof for these emergency measures. Unsteadiness on the ladder or roof can lead to severe injuries.

TEMPORARY REPAIRS

Cover holes in the roof, walls or windows with boards, tarps or plastic sheeting. Nail down plastic sheets or trash bags with strips of wood and secure them with duct tape. If the holes are large, you may need to support the plastic in the center to keep it from ripping from the weight of the rain.

If sections of the roof or floors are sagging, have a contractor or other knowledgeable person brace weak areas. Improper bracing may increase damage and the chance of injury, so do not attempt this work unless you are experienced in structural repairs.

CAUSES OF LEAKS

Storm and wind damage are responsible for some roof problems. Others are caused by defective materials, faulty construction or gradual deterioration. Here are some common causes of leaks:

- *Defective flashing.* Flashing is the sheet metal used in waterproofing roof valleys, hips and the angle between a chimney and a roof. Wet spots near a chimney or outside wall may mean the leak is caused by defective flashing, narrow flashing or loose mortar joints. Look for corroded, loose or displaced flashing on sloping roof valleys and at junctions of dormers and roof.

- *Clogged downspouts or eaves.* Check for choked downspouts. Accumulated water or snow on the roof above the flashing may cause a leak. Ice accumulations on eaves sometimes form ridges, which cause melting snow to back up under the shingles.

- *Cracks and deterioration.* Roofing (especially wood or composition shingles) usually deteriorates first on southern exposures. Check southern slopes for cracking or deterioration.

- *Holes.* Missing shingles or holes in the roofing may be causing wet spots. To find holes, check for a drip trail or spot of light coming through in the attic. Stick a nail, straw or wire through the hole to mark the spot on the outside.

REPAIRING LEAKS

Methods of repair will depend on the kind of roofing and the nature and extent of the leak. Unless you are experienced, hire a professional roofer for this work. Missing shingles should be replaced, holes repaired and cracks filled. Whatever method is used, avoid walking on patched sections.

Additional resources:

Your county family living agent, your local emergency government office, the American Red Cross, the Federal Emergency Management Agency

Related publications:

"Repairing Your Flooded Home," American Red Cross/Federal Emergency Management Agency, 1992.

Information from: University of Wisconsin Cooperative Extension, Pennsylvania State University Cooperative Extension Service, University of Minnesota Extension Service, University of Missouri Extension

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Cleaning Flood-Soiled Clothing and Bedding

WHAT TO SALVAGE AND HOW TO CLEAN IT

Unfortunately, cleaning your flood-soiled clothing and bedding is not the same as doing the usual family wash. Items need to be sanitized as you wash them. And your washing machine may be flood-damaged, making machine washing out of the question until you can get to a laundromat or friend's house. Nevertheless, you can help prevent mildew damage to clothes and bedding by sorting and drying items as soon as possible.

Even if your washing machine was not flooded, avoid using it until you know that the water is safe enough to drink and that your sewer line works. Before you wash clothes in the machine, run it through one full cycle. Be sure to use hot water and a disinfectant or sanitizer, such as chlorine bleach.

CLOTHING

When cleaning flood-damaged clothing:

- Separate wet items as soon as possible to keep clothing colors from running together. Sort out clothing that should be drycleaned.
- Take clothes and linens outdoors and shake out dried mud or dirt. Hose off extremely muddy items to avoid clogging your drain when you wash. If you don't have access to water, simply dry things out.
- If possible, soak badly soiled items overnight in cold water and detergent. Wring out and air dry if you're unable to machine wash right away.
- Check the labels on clothes and linens, and wash them in detergent and warm water if possible. Adding chlorine bleach to the wash cycle will remove most mildew and will sanitize the clothing. Because bleach fades some fabrics and damages others, use other sanitizers, such as pine oil cleaners, as necessary.
- If an item is still stained after washing, rewash before drying. Drying may make some stains more difficult to remove.
- Items to be drycleaned should be air-dried and taken to a cleaner as soon as possible.

Furs and leathers are usually worth the cost of professional cleaning. If you want to clean leather yourself, wash the mud off and dry the leather slowly. Keep it away from heat or sunlight while drying.

BEDDING

Bedding should be hung out to dry as soon as possible. Once dry, brush off excess soil and dirt. Pillows, while washable, usually should be discarded if soaked with contaminated floodwater.

- *Sheets and pillow cases.* Put sheets and pillow cases through two complete washing cycles. Use diluted liquid chlorine bleach to help kill germs. Follow your usual drying procedure.
- *Blankets.* Put washable blankets (acrylic, cotton) through two complete washing cycles. Air dry or use an automatic dryer at proper tempera-ture settings. Put wool blankets through a drycleaning process either at a commercial coin-operated facility or drycleaning plant. Shrinkage and the difficulty of thorough cleaning make wool blankets troublesome to wash.
- *Quilts and comforters.* Wash or dryclean depending on fiber content of the bedding. Usually, it is best to wash cotton quilts.

MATTRESSES

As a general rule, inexpensive mattresses are not worth the expense of professional sanitizing and reconditioning. They should be discarded.

- In some cases, a good inner spring mattress may be worth the cost of reconditioning. Get an estimate from commercial facilities.

- If the outside of the mattress is only slightly damp, brush off surface soil and wipe with a cloth wrung out of a solution of one cup denatured or rubbing alcohol and one cup water.

Additional resources:

Your county family living agent, your local emergency government office, the American Red Cross, the Federal Emergency Management Agency

Related publications:

"Repairing Your Flooded Home," American Red Cross/Federal Emergency Management Agency, 1992.

Information from: University of Wisconsin Cooperative Extension, Iowa State University Extension, the American Red Cross/Federal Emergency Management Agency, North Carolina Cooperative Extension Service

Cleaning Flood-Damaged Carpets and Rugs

WHEN TO DISCARD, CLEAN OR CALL A PROFESSIONAL

When faced with flood-damaged carpeting and rugs, your options will depend on the source of flooding. If floodwater consisted of clean basement seepage or lawn runoff into a sub-basement, drying and cleaning is an easy decision. But if sewage-contaminated floodwater has covered your carpeting, you probably will need to discard it for health safety reasons. You can assume the water and the carpet contain infectious organisms. Throw rugs can usually be saved.

GENERAL RULES

- Wall-to-wall carpeting, most large area rugs and any rug with foam backing should be discarded if flooded with contaminated water. Except for valuable rugs, the time and expense of professional cleaning generally is not worth the effort or the health risk.
- If you are determined to salvage carpeting soaked with contaminated water, consult a professional cleaning company that services carpets at its own cleaning and drying facilities. A steam cleaning (hot-water extraction) method is preferable.
- A wall-to-wall carpet soaked by clean rainwater can be salvaged. Have it professionally cleaned or clean it using the directions below.
- Throw rugs usually can be cleaned adequately in a washing machine.

CLEANING RAIN-SOAKED CARPETS

Cleaning basement carpeting indoors is not a good idea in summer because you are adding even more moisture to an already wet area. If the carpeting is installed with tack strips you may be able to remove it, have it cleaned and reinstalled. Padding is nearly impossible to clean so it should be replaced.

If you can't remove the carpeting, dry it as quickly as possible to minimize growth of mildew. If possible, use a wet/dry vacuum system. A dehumidifier can help remove moisture from the air. Keep windows closed when using a dehumidifier.

- When the carpet is thoroughly dry, vacuum the area.
- Shampoo and repeat the drying process. Keep in mind that most modern carpeting is made of nylon and should not be treated with bleach.
- Vacuum again.
- You can reduce a musty smell with the following process:

  a) Sprinkle baking soda over the carpet, working it in with a broom or sponge mop.
  b) Leave the baking soda treatment on overnight.
  c) Vacuum the baking soda out. Vacuum twice, moving back and forth in a different direction the second time.

Additional resources:

Your county family living agent, your local emergency government office, the American Red Cross, the Federal Emergency Management Agency

Related publications:

"Repairing Your Flooded Home," American Red Cross/Federal Emergency Management Agency, 1992.

Information from: University of Wisconsin Cooperative Extension, Iowa State University Extension, American Red Cross/Federal Emergency Management Agency

Flood-Damaged Furniture and Appliances

DECIDING WHAT TO SALVAGE AND TIPS ON RECONDITIONING

Evaluating appliance damage is a high priority after a flood. Have a service person check flooded appliances before you attempt operation or invest a lot of time in clean-up.

Deciding which furniture to save may be a more personal issue, especially if you have antiques and other pieces with sentimental value. Keep in mind that you don't need to repair all pieces of salvageable furniture immediately. You can clean, dry and store them in a warm, well-ventilated place until you have time to deal with them.

APPLIANCES

Before entering a home after a flood, be sure that the electricity to the dwelling has been completely shut off. (See the fact sheet, "Electrical Systems and Appliances.") Appliances should not be operated until they have been checked by service personnel.

Here are some things that may need to be done:

- Electrical motors may need to be reconditioned or replaced.
- Wiring and fixtures need to be checked and cleaned. They may also need replacement.
- Before cleaning and sanitizing an appliance, be sure the motor is in safe working order. It may not be worth the time to clean up the unit.
- A rust inhibitor may need to be applied to all metal parts. Even though an appliance may not have been submerged, rust can develop from dampness in the air.

REFRIGERATORS AND FREEZERS

Sanitize the refrigerator or freezer if water has seeped in. Be sure the motor and freezing unit are in safe working order and insulation is not wet. Wet insulation means replacement may be necessary.

- Remove and wash all shelves, crispers and ice trays. Wash thoroughly with water and detergent. Rinse with a disinfectant solution.
- Wash the interior of the refrigerator, including the door and door gasket, with hot water and baking soda. Rinse with a disinfectant solution.
- Leave the door open for about 15 minutes to allow free air circulation.
- If odor remains, place several pieces of activated charcoal in an open metal container, or use a commercial refrigerator deodorizer.
- Wash the outside with a mild detergent and hot water.

LAUNDRY EQUIPMENT

After washers and dryers have been reconditioned, sanitize them as follows:

- Pour a disinfectant (chlorine, pine oil or phenolic) into the empty washing machine. Then complete a 15-minute cycle at the "hot" water setting.

- Unplug the dryer and wipe the drum and door with a cloth dipped in disinfectant solution. Rinse with a cloth dipped in clear water.

- Leave the dryer door open until all parts are thoroughly dry — preferably overnight.

FURNITURE

Before starting to salvage damaged furniture, decide which pieces are worth restoring. Such decisions should be based on: the extent of damage, cost of the article, sentimental value and cost of restoration. Antiques are probably worth the time, effort and expense of restoration. Unless damage is severe, you may be able to clean and refinish antiques at home.

- Don't try to force open swollen wooden doors and drawers. Instead, take off the back of the piece of furniture to let the air circulate. You probably will be able to open the drawers after they dry.

- Solid wood furniture can usually be restored, unless damage is severe. It probably will need to be cleaned, dried and reglued. Wood alcohol or turpentine applied with a cottonball may remove white mildew spots on wood. Cream wood restorers with lanolin will help restore good wooden furniture parts.

- Wood veneered furniture is usually not worth the cost and effort of repair, unless it is very valuable. If veneer is loose in just a few places, you may be able to glue it adequately.

- Upholstered furniture soaks up contaminants from floodwaters and should be cleaned only by a professional. Get a cost estimate to see if furniture is worth saving. Usually, flood-soaked upholstered pieces should be thrown away unless they are antiques or quite valuable.

Additional resources:

Your county family living agent, your local emergency government office, the American Red Cross, the Federal Emergency Management Agency

Related publications:

"Repairing Your Flooded Home," American Red Cross/Federal Emergency Management Agency, 1992.

Information from: University of Wisconsin Cooperative Extension, Minnesota Extension Service, Pennsylvania State University Cooperative Extension Service, American Red Cross/Federal Emergency Management Agency

Caring for Important Papers

STEPS TO TAKE BEFORE AND AFTER A FLOOD

Valuable papers and records should be given maximum protection from any disaster. Water- and fire-resistant file cabinets are available for storing some records at home. A commercial storage area, such as a safe-deposit box, will assure protection from theft and physical damage.

Consider making copies of your valuable papers for selected professionals, family members or friends, to assure their prompt availability when needed. Lists of all such documents and the location of each should be stored in more than one place.

If important documents or books have been damaged by floodwater, follow the instructions outlined here for drying. However, it is a good idea to photocopy any important papers as a precautionary measure. Even if papers appear to have dried successfully, they may disintegrate rapidly because of substances in the floodwater.

KEEP AN UP-To-DATE HOUSEHOLD INVENTORY

An inventory of household items and other property is especially valuable in case of a disaster. When making the inventory, do not overlook items kept in cabinets, closets, the freezer, garage and yard. Consider making a video of your inventory and property; at minimum, take some photographs. An accurate inventory will help determine if you have enough insurance to cover the contents of your home. Whenever possible, record the date of purchase and purchase price of items. Keep the inventory current.

PAPERS TO BE STORED IN THE HOME

Keep the following papers stored at home in a water-proof, fire-proof, locked box:

- Family advisors' names and addresses
- Educational, employment and health records
- Copies of birth and marriage certificates, insurance policies
- Driver license numbers, income tax returns, current bank balances, loan payment books
- Guarantees and warranties, appliance manuals, rental property records
- Household inventory, safe-deposit records, one copy of a list of valuable papers and their locations

PAPERS TO BE STORED IN A SAFE-DEPOSIT BOX

Keep the following papers stored in a safe-deposit box, especially during a disaster:

- Property records, deeds, titles and/or leases
- Copies of wills (his and hers); birth, death and marriage certificates; divorce decrees; adoption or custody papers; citizenship papers; passports; military service records
- Stocks records, bond certificates, contracts (including promissory notes), supporting documents of years of large transactions, unusual losses or deductions
- List of insurance policies, automobile bills of sale and titles, social security cards

- Government savings bonds, religious records, retirement papers, copyrights and patents

- Household inventory, one copy of a list of valuable papers and their locations

DRYING PAPERS AND BOOKS

Dry papers and books slowly for best results. Photocopy valuable papers as a precautionary measure because flood-damage may cause rapid deterioration. If you don't have the time to clean and dry them immediately, consider putting them in the freezer to prevent mildewing. Place wax paper between layers of paper bundles or books so they can be separated easily when removed.

- Wipe book covers with a solution of one part rubbing or denatured alcohol and one part water.

- Place books on end with leaves separated. When partially dry, pile and press books to keep pages from crumpling. Alternate drying and pressing until books are thoroughly dry. This helps prevent mildew. Use a fan to hasten drying.

- If papers and books are very damp, sprinkle pages with corn starch or talcum powder to absorb moisture. Leave powder for several hours, then brush it off.

- For valuable books that are nearly dry, consider pressing the pages with an electric iron set on low. This is a tedious process, but may be worth the effort. Separate the pages to prevent musty odors.

- Some chemicals help stop mold growth. Contact your county Extension office for recommendations on use.

- When books are thoroughly dry, close them and use C-clamps to help them retain their shape. Wipe vinyl and leather book covers with a light coating of petroleum jelly or leather or vinyl dressing.

Additional resources:

Your county family living agent

Related publications:

“Repairing Your Flooded Home,” the American Red Cross/Federal Emergency Management Agency, 1992.

Information from: University of Wisconsin Cooperative Extension, University of Florida Cooperative Extension Service, North Carolina Cooperative Extension Service

Salvaging Food After a Flood

SAFETY MEASURES IN THE KITCHEN AND GARDEN

Food that has come in contact with floodwaters is generally unsafe to eat. Floodwaters usually carry a high load of bacteria and filth with them, and may contain oil or chemical wastes as well. With the exception of canned foods and some produce, most food touched by floodwaters should be discarded.

The safety of garden produce depends upon the type of flooding and type of produce. Follow the guidelines at right, which also cover refrigeration and freezer concerns when the power is out. And remember: When in doubt, throw it out.

FLOODED ITEMS TO DISCARD

- Fresh produce, meat, poultry, fish and eggs.
- Opened containers and packages.
- Submerged, unopened glass jars that have cardboard lid liners, such as mayonnaise or salad dressing.
- Submerged, unopened, home-canned jars with broken seals. To check seal, remove ring and test the flat lid with fingertips. If the lid lifts off easily, discard the food.
- All food in cardboard boxes, paper, foil, cellophane or cloth.
- Spices, seasonings and extracts, flour, sugar and other staples in canisters.
- Cans that are dented, leaking, bulging or rusted.

FLOODED ITEMS TO SAVE

Some fruits, vegetables, and unopened canned goods and glass jars of food can be salvaged. Sanitizing, and in some cases, cooking is necessary for safe use.

- To sanitize cans and glass jars of food:

  a) Mark contents on can or jar lid with indelible ink.
  b) Remove labels. Paper can harbor dangerous bacteria.
  c) Wash jars and cans in a strong detergent solution with a scrub brush.
  d) Immerse containers for 10 minutes in a solution of 2 tablespoons chlorine bleach per gallon of room temperature water.
  e) Allow containers to air dry before opening.

- Citrus fruits should be washed, sanitized with a light bleach solution (see above) and peeled before eating.
- Potatoes, carrots, apples and other firm fruits should be sanitized, peeled, if possible, and cooked before eating. Do not eat raw fruit or vegetables, even if they have been sanitized.

WHAT ABOUT THE GARDEN?

Some garden produce may be salvaged. Sanitizing, peeling and cooking is recommended. Follow these guidelines:

PREVENTION IS THE KEY

If it's not too late, prevent floodwater from coming into contact with food by:

- **Raising refrigerators and freezers by placing cement blocks under their corners.**
- **Moving food from low cabinets.**
- **Moving canned goods and other food stored in the basement to the upstairs.**

Additional resources:

Your county family living agent, your local emergency government office, the American Red Cross, the Federal Emergency Management Agency

Related publications:

"Repairing Your Flooded Home," the American Red Cross/Federal Emergency Management Agency, 1992.

UW-Extension Publications–

"Management of Food for Emergencies," (B3045);

"Quick Consumer Guide to Safe Food Handling," (BG248);

"When the Home Freezer Stops," (B2837);

"Keeping Food Safe," (B3474).

- If the floodwater contained waste from septic tanks, sewage lagoons or a pasture, your garden will take about a month to become clean. Don't eat or preserve food during this time.
- Ask if your local health department will test the garden soil for harmful bacteria. It may be able to determine whether immature root crops are safe.
- Discard leafy greens such as lettuce, spinach and cabbage, as well as soft berries. These are highly susceptible to bacterial contamination. Silt and other contaminants may be difficult to remove from them.
- Wash beans, peas, tomatoes, peppers and summer squash in water. Then soak in a weak chlorine solution of 2 tablespoons chlorine bleach to a gallon of water. Peel and cook them thoroughly before eating.
- For underground vegetables such as carrots and potatoes, wash in water and sanitize as above. Peel and cook them thoroughly before eating.
- Produce with a protected fruit or impervious outer skin, such as peas, melons, eggplant, sweet corn or winter squash, should be washed and disinfected before the outer shell, skin or husk is removed. Then shell, peel or husk the produce and cook if possible.

REFRIGERATION AND FREEZER CONCERNS

If the electricity is off to the refrigerator or freezer, follow these guidelines:

- Discard refrigerated meats, seafood, milk, soft cheese, eggs, prepared foods and cookie doughs if they have been kept above 40 degrees F. for over two hours. Also discard thawed items that have warmed above 40 degrees F., with the exception of breads and plain cakes.
- Discard any refrigerated items that turn moldy or have an unusual odor or appearance.
- Refreeze partially or completely frozen foods.
- Cold but fully thawed, uncooked meat, fish or poultry should be checked for off-odor. If there is none, cook and eat or cook and refreeze.
- Discard combination dishes such as stews, casseroles and meat pies if they are thawed.
- Refreeze thawed (but cold) juices, baked goods and dairy items such as cream, cheese and butter.
- Do not refreeze thawed vegetables unless ice crystals remain. Cook and use them if there are no off-odors.

Information from: University of Wisconsin Cooperative Extension, Purdue University Cooperative Extension Service, University of Missouri Extension

Disinfecting Dishes, Cookware and Utensils

SAFETY GUIDELINES AFTER A DISASTER

During a disaster such as a flood, tornado or fire, kitchen items easily can become contaminated. Floodwaters may contain silt, raw sewage, oil or chemical wastes, while fires may leave residues from toxic fumes or fire-fighting chemicals. Before using any item that has come in contact with these substances, follow the guidelines at right.

DISASSEMBLE, WASH AND DISINFECT

Take apart any item that can be cleaned in pieces. If possible, remove handles from pots. If you have a dishwasher and the hot water temperature is at least 140 degrees F., use a long wash cycle and heated drying cycle to clean and disinfect dishwasher-safe items. Regarding other items, or all items if you don't have a dishwasher, follow these steps:

- Wash all items in a a strong detergent solution. Use a brush to remove dirt. Rinse in hot water.
- Immerse glass, porcelain, china, plastic dinnerware and enamelware for 10 minutes in a disinfecting solution of 2 tablespoons of chlorine bleach per gallon of hot water.
- Disinfect silverware, metal utensils, and pots and pans by boiling in water for 10 minutes. Chlorine bleach should not be used in this case because it reacts with many metals and causes them to darken.
- Air-dry dishes. Do not use a towel.
- Discard and replace soft, porous plastic or wood items saturated by floodwater, since they cannot be sanitized. These include baby bottles, nipples and pacifiers.
- If cupboards and counters come in contact with floodwater, clean and rinse them with a chlorine bleach solution before storing dishes.

Additional resources:

Your county family living agent, the American Red Cross, the Federal Emergency Management Agency

Related publications:

“Repairing Your Flooded Home,” American Red Cross/Federal Emergency Management Agency, 1992.

Information from: University of Wisconsin Cooperative Extension, Michigan State University Cooperative Extension Service, Illinois Cooperative Extension Service, University of Florida Cooperative Extension Service

Flooded Private Sewage Systems

SAFETY, SANITATION AND CLEAN-UP CONCERNS

Flooding of a private sewage system can be a hazardous situation for homeowners. It may lead to a back-up of sewage in the home, contaminated drinking water and lack of sanitation until the system is fixed. While you don't have control over rainfall or flooding in your area, you can prepare for high water problems and respond appropriately to emergency flooding.

HOW PROBLEMS OCCUR

When flooding or saturated soil conditions persist, a private sewage system cannot function properly.

Soil treatment systems for wastewater rely on aerobic (with oxygen) regions to reduce the amounts of chemicals and living organisms (viruses, bacteria and protozoa). When the soil is saturated or flooded, those hazardous materials can enter the groundwater and your drinking water supply.

PREPARING FOR FLOODING

If you are prepared when flooding occurs, your family can be safe and your system should survive. To prepare for a flood you should:

- *Make sure all septic tanks are full of liquid.* The high-water season is not the time to have tanks pumped; empty tanks are buoyant and may "pop" out of the ground during flooding.
- *Plug floor drains, if necessary, to keep sewage from backing up into the basement.* Floodwaters may still enter the basement through cracks and seams, however.

DURING A FLOOD

- *Discontinue use of your private sewage system.* Use portable toilets, if possible, or use any large container with a tight-fitting lid for a temporary toilet. Line the container with a plastic bag. After each use, add chlorine bleach or disinfectant to stop odor and kill germs. If necessary, bury wastes on high ground far away from your well.
- *Remember that a well may become contaminated during a flood.* Therefore, DO NOT DRINK THE WATER. Drink bottled water, or disinfect water before drinking. Contact your local health department for disinfection instructions.
- *Do not bathe or swim in floodwater.* It may contain harmful organisms.
- *Shut off power to a sewage lift pump if you have one in the house or in a pump chamber (mound, in-ground pressure, at-grade systems).*

AFTER THE FLOOD

- *Do not use the sewage system until water in the disposal field is lower than the water level around the house.*

- *If you suspect damage to your septic tank, have it professionally inspected and serviced.* Signs of damage include settling or inability to accept water. Most septic tanks are not damaged by a flood since they are below ground and completely covered. However, sometimes septic tanks or pump chambers become filled with silt and debris, and must be professionally cleaned. If tile lines in the disposal field are filled with silt, a new system may have to be installed in new trenches. Because septic tanks may contain dangerous gases, only trained specialists should clean or repair them. Wisconsin code requires licensed plumbers for any repairs.

- *Discard any items that are damaged by contaminated water and cannot be steam cleaned or adequately cleaned and disinfected.*

- *Do not pump water out of basements too quickly.* Exterior water pressure could collapse the walls.

- *If sewage has backed up into the basement, clean the area and disinfect the floor with a chlorine solution of one-half cup of chlorine bleach to 1 gallon of water.*

- *Contact the county health department or county Extension office to obtain a drinking water test kit.* (See the fact sheet "Water Contamination in Private Wells.") Do not drink the water until it has been tested and is safe.

Additional resources:

Your county family living agent, your county code administrator, your local health department, the Wisconsin Bureau of Building Water Systems, Department of Industry, Labor and Human Relations.

Related publications:

UW-Extension publication "Care and Maintenance of Residential Septic Systems," (B3583).

Information from: University of Wisconsin Cooperative Extension; the Wisconsin Bureau of Building Water Systems, Department of Industry, Labor and Human Relations; Pennsylvania State University Cooperative Extension Service

Controlling Insects After Flooding

HOW TO MINIMIZE MOSQUITO, FLY AND OTHER INSECT PROBLEMS

After a flood, mosquitoes, flies and other insects may be more abundant than usual, posing potential health problems. Filth and debris left by the storm create excellent breeding conditions for houseflies and mosquitoes, some of which may be capable of spreading typhoid, dysentery and encephalitis. The key to controlling insects is removal of their breeding places–any standing water, especially stagnant water. In warm weather this should be done immediately after you return to the premises.

ELIMINATE BREEDING SPOTS

- Empty water from barrels, old tires, cans and other vessels. In addition to being a breeding place for insects, this water may be polluted by floodwaters. Check clogged gutters and flat roofs that have poor drainage. Make sure cisterns, cesspools, septic tanks, fire barrels and rain barrels are covered tightly.
- Drain ponds, pools or any standing water in which mosquitoes may breed.
- If drainage is impossible, treat water puddles still standing after a week with larvicide as recommended by a county Extension agent.
- Dispose of refuse. Bury animal carcasses as soon as possible. Remove garbage at least once every week. Be sure garbage cans have tightly fitting lids. When using manure and garbage as a fertilizer, spread it thinly so it will dry quickly and not support fly development.

MAKE REPAIRS

Patch screens and other places where mosquitoes may enter buildings.

SPRAYS AND REPELLENTS

Use a household spray or an aerosol bomb to kill mosquitoes, flies or other insects that get into buildings. Spray shrubbery and shaded areas of buildings to kill adult insects. Contact your county Extension agent for specific recommendations.

If possible, keep small children indoors, especially in the evening. If you must go outside at dusk, use a repellent on exposed parts of your body and clothing.

Additional resources:

Your county agricultural agent

Information from: University of Wisconsin Cooperative Extension, Pennsylvania State University Cooperative Extension Service

Rodent and Snake Control After a Flood

SAFETY PRECAUTIONS AND ELIMINATION

Following floods, rats and other rodents may move into buildings to escape floodwaters. Snakes are often forced into places where they are not usually found. Upon re-entering flooded homes or buildings, you will need to be wary of these possibilities. Rats can carry disease and parasites, while snakes may be poisonous or at least frightening. Neither pose serious problems in Wisconsin, but the chance of an incident increases after a disaster.

WHERE THE RATS ARE

Because of the danger of rat infestation, use caution when entering flooded buildings:

- Carry a solid club and a flashlight.
- Inspect likely hiding places for rats. Check closets, drawers, mattresses, appliances, upholstered furniture, stacks of clothes or paper, dark corners, attics and basements.
- Be extremely careful when approaching rats. They may be aggressive.

CONTROLLING RATS

If rats continue to be a problem after floodwaters recede, contact your county Extension agent or professional pest control operator for advice. If you proceed on your own be extremely careful with any rodenticide or trap. To minimize rat problems:

- Remove trash piles and piles of damaged furniture or equipment. Store materials on platforms or shelves 12 to 18 inches above the ground.
- Remove food sources. Store food supplies in rat-proof bins or containers. Suspend garbage containers from trees or posts. Remove animal carcasses, as they may attract rats.
- If you are bitten by a rat, wash the wound with soap and water and see a doctor immediately. Rats may carry diseases and at the least, rat bites can cause infection. If the rat is captured or killed, health authorities may wish to check it for rabies or other diseases. When picking up a carcass, use the inside of a plastic bag to avoid touching it. Double-seal it in plastic and freeze until further notice.

INSPECTING FOR SNAKES

It is important to know what poisonous snakes may be common to your area. Only two poisonous snakes exist in Wisconsin: the timber rattlesnake and the massasauga rattlesnake. Both species are restricted to the southwest quarter of the state. The massasauga is an endangered species and is rarely encountered. Non-poisonous snakes, however, are common and may bite.

Remember that all snakes are beneficial to the ecosystem and should not be killed indiscriminately — poisonous snakes included. But follow these precautions upon entering a flooded structure or area:

- Be alert for snakes in unusual places. They may be found in or around homes, barns, outbuildings, driftwood, levees, dikes, dams, stalled automobiles, piles of debris, building materials, trash or any type of rubble or shelter.

- Keep a heavy stick or long-handled tool handy. After dark, carry a strong light.

- Before beginning rescue or clean-up operations, search the premises thoroughly for snakes. Wear heavy leather or rubber high-top boots, and heavy gloves. Use rakes, pry bars or other long-handled tools when removing debris. Never expose your hands, feet or other parts of your body where a snake might be.

- Explain to children the dangers of snakes during storm or flood conditions and the precautions they should follow. Do not allow children to play around debris.

- If you kill a poisonous snake, use a stick, rake or other long-handled tool to carry it away for disposal.

- If you realize you are near a snake, remain still—sudden movements may cause the snake to strike. If the snake doesn't move away from you after a few minutes, slowly back away from it.

- If someone is bitten by a poisonous snake, call a doctor immediately. If bitten by a non-poisonous snake, clean the wound and watch for signs of infection.

CONTROLLING SNAKES

To minimize chances of finding snakes indoors, block openings where they might enter buildings. Snakes can pass through extremely small openings and usually enter near or below ground level. Some other suggestions:

- Be sure doors, windows and screens fit tightly.

- Search walls and floors for holes or crevices. Inspect the masonry of foundations, fireplaces and chimneys. Then plug or cement these openings.

- Plug spaces around pipes that go through outside walls.

- Fasten galvanized screen over drains or ventilators, or over large areas of loose construction.

Additional resources:

Your county agricultural agent

Related publications:

UW-Extension Publications–

“Snakes of Wisconsin,” (G3139);

“The Raccoon,” (G3304);

“Skunks: How to Deal With Them,” (G3273);

“Meadow Mouse Control,” (A2148);

“Tree Squirrels in Wisconsin: Benefits and Problems,” (G3522).

Information from: University of Wisconsin Cooperative Extension, Pennsylvania State University Cooperative Extension Service
University of Wisconsin-Extension • Cooperative Extension

Salvaging Stored Wet Feed and Grain

DRYING, MARKETING AND SAFE FEEDING

Time is of the essence in salvaging wet feed and grain. Both will begin to heat and mold very quickly, leading to spoilage as well as the possibility of spontaneous combustion. As soon as possible, you should remove dry portions of grain and store them separately. Dry bales of hay should be removed and restacked in a dry location, since capillary action will draw water up into the stack.

Wet feeds should be presumed harmful to animals until tested. They may contain contaminants from floodwaters, as well as mold spores which sometimes produce dangerous toxins.

USE DRYER IF POSSIBLE

If part of a grain bin has been flooded, remove dry grain *from the top* using a vacuvator or any other means. Use one of the following methods for handling wet grain:

- Get the wet grain to a dryer quickly, if possible. This is the surest way to save wet grain.
- If the grain depth can be kept below 6 feet, use a natural-air bin drying system with a perforated floor and a high-capacity drying fan. Sup-plemental heat should only be used during periods of high humidity. Do not raise the air temperature more than 10 or 15 degrees F.
- If a dryer is not available, spread the grain in as dry a place as possible. Don't pile it any higher than 6 inches. Stir it daily to prevent overheating and to speed drying. Watch for and remove molded grains.
- Wet grain can be ensiled if it is intended for feed and the moisture content ranges between 25 and 35 percent. If using a conventional silo, see your county agricultural agent about treating the grain with proprionic acid to prevent mold.

DRY AND SHELL WET EAR CORN

Separate dry corn from wet and store it on high ground. If the ground is wet, first cover the area with plastic or building paper. Handle wet ear corn as follows:

- Dry the corn if facilities and equipment are available. Remove corn from crib, since mud and debris washed into the crib may make drying difficult or impossible. Then place the ear corn over a drying tunnel and force air through the corn with a fan.
- Shell the corn if shelling equipment is available.

GUARD AGAINST HAY FIRES

Flooded hay should be disposed of or used on fields as a fertilizer. It is probably unsafe for animals and not worth the time and expense of drying. Because of hay's tendency to heat and mold quickly, it should be spread out to aerate as soon as possible and turned often. Hay bales that are 30 to 40 percent wet pose the greatest risk of fire. Check hay storage often for pungent odors, hot damp areas on the stack, emission of water vapors and other signs of heating.

REPLACING HAY WITH GRAIN

If you must replace conventional roughage feeds with grain because of flooding, consider fibrous grains such as oats, barley, ground ear corn or one of the high-fiber byproducts such as brewers grains, corn gluten feed or soy hulls.

Continue to feed hay or straw unless you have had experience with high grain feeding. You must maintain a minimum amount of forage in cattle diets. Check with your nutritionist or county agricultural agent for guidelines. Spread any major changes in a feeding program over a period of several days. Observe animals carefully during the transition.

- To check a stack's temperature for fire risk, drive a sharp pointed pipe into the hay, lower a thermometer inside the pipe, and leave it there for about 20 minutes. At 150 degrees F., the hay is approaching the danger zone. At 170 degrees F., hot spots or fire pockets are possible. Have the fire department on standby.

FIND A LOCAL MARKET

If it is not possible to dry grain artificially, try to find a local market for it. Usable flood-damaged grain must be sold at a salvage price, possibly to a large livestock feeder who can use it before it spoils. Grain should be kept in airtight storage to prevent spoilage.

SEED GRAIN AND SILAGE OFTEN A LOSS

Wet seed grain probably will not be suitable for seed, as wetness causes the seed to germinate. Subsequent drying would stop germination and likely kill the seed or reduce its viability. Do not feed seed grain to livestock, since it may contain toxic additives.

Flooded silage likewise will be a loss. Its waterlogged state will hurt feed value, as will any contaminants from the water. Like hay, it might be spread on fields as a fertilizer.

SAFETY WITH WATER-DAMAGED FEEDS

- *Testing.* Do not feed flood-damaged grains until they are tested for *mycotoxins,* toxic substances produced by fungi. Ask your county Extension agent for locations of testing laboratories. Even if the feed is deemed safe to use, watch animals carefully for signs of illness.

- *Nutritive value.* Mixed feeds, grains and roughages which have heated or spoiled will have little nutritive value for livestock, depending on the extent of the damage.

- *Safety.* Do not feed heated, molded or sour feeds, or moldy legume hays (such as alfalfa or clover) to any livestock. Reduced performance, sickness, abortion or death may occur.

Additional resources:

Consult your veterinarian or county agricultural agent before using flood-damaged feeds.

Information from: University of Wisconsin Cooperative Extension, Pennsylvania State University Cooperative Extension Service, University of Missouri Extension

Maintaining Livestock Health After a Flood

ISSUES OF DISEASE CONTROL AND SANITATION

If your fields or farm buildings have been flooded, take special precautions against flood-related accidents or diseases in poultry and livestock. Give animals extra care, particularly if they have been stranded by floodwater, and have been off regular feeding schedules. Keep fields clear of harmful debris, and clean buildings as soon as possible. In addition, watch for signs of flood-related diseases, such as lameness, fever, difficulty breathing, muscle contractions or swelling of shoulder, chest, back, neck or throat. Be prepared to contact a veterinarian if you spot trouble.

DISEASE CONTROL

Following a flood there may be danger of infectious diseases in livestock, but unless serious outbreaks of infection have occurred recently, the situation should not be alarming. Observe these precautions:

- Where large numbers of animals are assembled, watch for any indication of infectious diseases such as pneumonia, foot rot or leptospirosis. These diseases are more likely to occur where cattle are crowded on wet ground and where horn flies and houseflies are abundant.
- Promptly report any sign of disease to a local, state or federal veterinarian.
- Contact a veterinarian about vaccinating animals for immunity from flood-related diseases such as anthrax, blackleg and swine erysipelas.

FEED AND WATER

- Provide clean, uncontaminated water.
- Inspect feeds such as corn, wheat and hay. Do not feed flood-damaged or moldy hay unless it has been tested for mycotoxins, toxic substances produced by fungi.
- Do not use any feed or forage that may have been contaminated by chemicals or pesticides.

PASTURELAND

- Standing water may have ruined some pastures. Lack of adequate forage could force animals to eat poisonous plants. Remove fallen wild cherry limbs from pastures to prevent livestock poisoning.
- Before restocking flooded pastures, remove debris, especially along fence lines and in corners. Livestock could be injured from pieces of barbed wire, sharp metal and trash.

PROTECTING DAIRY COWS

- Try to milk at regular times. It is better to lose the milk from one milking than to stress high producing cows.
- If you must use a neighbor's milking parlor, try to keep the two herds separate.

- If feed supplies are limited, give the largest portion of available feed to the highest producing cows and those recently fresh. This may be a good time to cull the herd.

- Clean and sanitize milking parlor, dairy barn and equipment before returning to normal use.

- Watch for signs of mastitis, which is likely to flare up if milking methods, time and equipment have been changed.

SANITATION

- Clean out hog houses, barns and chicken houses. Spray buildings with a good disinfectant before animals occupy them again. Air buildings thoroughly to dry them out.

- Remove debris from dairy barns. Scrub and disinfect walls, ceilings, floors, stanchions and other equipment.

- Scrub the milk house and equipment with detergent and hot water. Sanitize equipment, walls, ceilings and floors with dairy sanitizer equipment.

- Dispose of animal carcasses promptly. If there is no rendering company operating nearby, burn or bury carcasses deeply in a place approved by your local soil conservation office.

INSECTS

Mosquitoes and other pests may be abundant after a flood. They not only annoy animals, but some species carry disease. Spray animals with an insect repellent as recommended by your county agricultural agent.

Additional resources:

Your county agricultural agent, your local veterinarian

Information from: University of Wisconsin Cooperative Extension, Pennsylvania State University Cooperative Extension Service

Flooded Farm Vehicles and Equipment

TIPS ON CLEANING AND RECONDITIONING

Try to clean tractors, trucks and farm equipment as soon as possible. Delay will make dirt and silt harder to remove and may cause considerable rusting and corrosion. If you use farm vehicles and equipment before proper reconditioning, you may seriously damage them.

Have your dealer or another expert recondition engines. They need to be completely disassembled for cleaning and reconditioning. Do not try to move or start an engine that has been submerged until it has been cleaned and reconditioned, since dirt will damage bearings and precision parts. If the tractor was submerged only to the platform, you will need to service only the wheel bearings and moving parts that were under water.

EMERGENCY CLEANING

If you must use the tractor or engine immediately, or if you think the cost of professional reconditioning is not worthwhile, use the following procedure. *This procedure isn't thorough enough to prevent possible damage or need for overhaul in the future.*

- Clean exterior thoroughly with a hose. Scrub greasy deposits with solvent.
- Remove spark plugs or fuel injectors, air cleaner, intake manifold and carburetor. Clean these parts thoroughly with solvent.
- Drain the crankcase. Flush the crankcase with oil and refill with clean oil. Also disconnect fuel lines, blowing them out with compressed air.
- Crank the engine slowly with spark plugs or fuel injectors removed to force water out of cylinders. Squirt light lubricating oil into each cylinder and let it stand for about five minutes. Then crank the engine slowly to lubricate cylinder walls and rings.
- Replace all filters — engine, fuel, hydraulic.
- Completely flush out the fuel system — tank, pump, lines — with #1 diesel fuel. Be extremely careful to avoid fire danger.
- Replace starter and generator. Have an expert service them.
- Drain and flush the transmission and final drive with solvent. Refill with new, clean oil.

WHEEL BEARINGS, COOLING SYSTEMS AND BATTERIES

- Remove and clean unsealed wheel and track bearings with solvent. Lubricate and replace the bearings. Factory-sealed bearings should not need cleaning if the seal is unbroken.
- Flush the cooling systems with fresh water, and clean the radiator fins.
- Replace the battery, if necessary. If it was submerged, it will probably need to be replaced.

STARTING AND INITIAL OPERATION

- Examine the machine and turn it over by hand after you have cleaned and replaced all parts. If it turns freely, it is probably ready for operation. Turn on the engine and operate the machine at low speed until you are sure all parts are working smoothly.

- If there is a substantial amount of dirt in the crankcase, transmission or gear train, change the oil and oil filter after operating the machine for a few hours. Using fresh lubricant is cheaper than paying for additional repairs.

ADDITIONAL STEPS FOR TRUCKS AND CARS

- Remove inside door panels. Clean and lubricate latches and window raising mechanisms.

- Remove seats and floor mats. Brush and vacuum thoroughly. Clean washable surfaces with soap and water. Use rug or upholstery shampoo on non-washable areas. Dry thoroughly.

- Disassemble leaf springs. Clean or replace spring pads if necessary.

- Have brakes and steering mechanism checked before you drive the vehicle.

RECONDITIONING FARM IMPLEMENTS

Follow applicable steps above, and clean rest of machine as follows:

- *Chains.* Soak chains in solvent for several hours, then remove chains and allow solvent to drain out of them. Soak chains for several hours in light oil, then drain off excess oil and replace chains on machine.

- *Gears and sprockets.* Clean exposed gears and sprockets with cleaning solvent. Coat gears with light oil.

- *Gear cases.* Inspect enclosed gear cases for water or grit. Water may be present below the oil. If you find water or grit, or if you are in doubt, drain the case, flush it with solvent and refill with clean oil.

- *Belts.* Examine all belts for tears or cracks. Repair or replace them as necessary.

- *Cutting parts.* Remove knives and cutter bars from mowers and combines. Clean and dry them. Coat cutter parts with light oil and reassemble. Inspect the insides of combines and remove accumulated dirt, chaff, debris or water.

Additional resources:

Your county agricultural agent

- *Soil-working tools.* Clean dirt and rust from surfaces of soil-working tools such as mold boards, discs and cultivator shovels. Coat these tools with rust preventive grease or used crankcase oil.

Information from: University of Wisconsin Cooperative Extension, Pennsylvania State University Cooperative Extension Service

Tips for Handling Flooded Soils

CLEAN-UP, SOIL TESTING AND COVER CROPS

GENERAL GUIDELINES

If sediment came from fertile fields of your upstream neighbors, the fertility status of the field will probably be unchanged or higher than before the flood. If heavy sedimentation occurs, these soils should be tested to determine nutrient status. Take soil samples at a 6- to 8-inch depth in at least 15 locations per field. Each soil sample should represent 20 acres or less. Areas with significant differences in textures should be sampled separately.

Sand deposits may have to be removed or spread over other areas and mixed with the more productive soil beneath. Sand deposits on top of silty or clay-type soils deeper than 4 inches may decrease potential crop yields. Determine the location, depth and amount of coverage of sand. Call your county Extension agent for further guidelines.

- Open all drainage ditches.
- Remove debris from fields and pastures. Look carefully for partially hidden objects that could injure livestock or damage machinery. Check hedge and fence rows carefully.
- To prevent severe soil compacting, avoid running trucks and heavy farm equipment over wet soils. Most soils are not dry enough for traffic or cultivation until the top 5 or 6 inches crumble, rather than slick over or pack.
- Encourage the growth of cover crops such as rye or wheat. Any type of plant growth is effective in drying waterlogged soils.
- It is usually not necessary to remove silt deposits. After soils are dry enough to work, level and mix silt deposits into original topsoil, if practical.
- Apply animal manure and incorporate into soil. Check with your county Extension agent for recommended application rates.
- The fertility level of flooded soils will probably change over a period of time. Do not guess at requirements. Take soil samples to determine new fertility levels. Follow recommendations. Allow for nutrients supplied by applied animal manures. When sampling silted fields, make sure the samples represent the soil mix that will exist after deposited silt is mixed with the original topsoil.
- Avoid deep tillage or subsoiling unless advised by an agronomist. Deep tillage or subsoiling is rarely beneficial and could be harmful.

Additional resources:

Your county agricultural agent, Soil Conservation Service

Related publications:

UW-Extension Publications–

“Management of Wisconsin Soils,” (A3588);

“Sampling Soils for Testing,” (A2100).

Information from: University of Wisconsin Cooperative Extension, University of Missouri Cooperative Extension Service, Pennsylvania State University Cooperative Extension Service

Salvaging Crops After Flooding

RECOVERY OF ALFALFA, IRRIGATED PASTURES AND HAY

Many factors affect the extent of crop damage after a flood. Seasonal temperatures can be a major factor. A July flood, for example, is often much worse for crop survival than a spring flood. The warmer mid-summer weather increases the rate of damage and death to submerged plants. During spring flooding, temperatures are colder and plants can survive longer under water.

Plants that encounter flash-flooding along creeks where the water rises and recedes quickly are most likely to survive. They will experience less oxygen depletion than submerged plants. Other factors for survival include water movement and plant height. Standing water is more harmful than moving water. Plants with some leaves protruding from the water are more likely to live.

Restoration of alfalfa, irrigated pastures, perennials and hay will depend heavily on all of these factors. But it also depends on the steps you take toward recovery.

ALFALFA

Alfalfa can withstand submersion for a limited time, depending on its stage of growth. Dormant plants may withstand submersion for as long as seven to 10 days. Growing plants can usually withstand submersion for less than three to four days without damage.

Alfalfa can recover from moderate silt deposits. Silt deposits of over 2 to 3 inches will weaken the stand, and you may need to regrade and re-establish in places.

Limit reseeding of established fields to silted patches within the field. If the entire field is silted, rework and reseed the field. Where alfalfa stand is over two years old, overseed with temporary crop and reseed alfalfa at least one month after having reworked the field.

You can reseed small areas with fast-growing grasses. This will help provide forage until the entire field can be reworked. In old fields, seeding to annual crops such as ryegrass will provide some hay and also will help control weeds.

IRRIGATED PASTURES

You probably can restore irrigated pastures without serious production losses if silt deposits are not over 2 inches and erosion is minimal.

Recovery usually depends on the type of legume. Alfalfa probably will recover from moderate silting better than white clover varieties. White clover will not survive silting that covers the ends of the growing stems or stolons. Ladino clover, however, will fill in stands from a few surviving plants if the area is not too large.

Grasses such as ryegrass, orchardgrass, fescue and meadow foxtail will probably grow through a moderate silt deposit, and can stand several days of flooding without injury. Tall fescue will tolerate more water than ryegrass or orchardgrass. Meadow foxtail and reed canary grass can stand longer submersion than other perennial grasses.

Subsurface water saturating the root zone of deep-rooted crops such as alfalfa can damage the plant as much as surface water. To take care of excess soil moisture, open drainage ditches as soon as possible.

OVERLY MATURE PERENNIALS

Some overly mature alfalfa or clover grass can be partially salvaged by mixing with less mature forage and ensiling the crop. Although nutritional value will be low, this is a fast method of removing the crop to ensure a good second cutting.

Ensile perennials in either conventional upright or temporary trench silos. To make a trench silo:

- Locate the trench where drainage is good.
- Design the trench for efficient feeding. A long, narrow, deep trench results in less feeding loss than a wide, shallow trench.

To make the silage:

- Direct cut or wilt to 65 to 70 percent moisture.
- Chop fine.
- Pack thoroughly.
- If available, add 100 to 200 pounds of corn and cob chop per ton of ensiled nutrients. This will improve fermentation, quality and palatability.

HAY

To minimize damage to flooded hay crops:

- Remove old growth from fields that have not been harvested. This will encourage a good aftermath crop.
- Make this crop into hay or silage.
- If crop is silt-damaged, chop it uniformly back onto the field. Then topdress immediately with fertilizer. You also may want to apply nitrogen to stimulate legumes as well as grasses. Check with an agronomist for recommended application rates.
- On fields harvested just prior to the flood, make crop into hay or silage. Then topdress field with fertilizer. Check with your county agricultural agent for specific recommendations.
- If growth is short or yellow, topdress immediately.

Additional resources:

Your county agricultural agent

Information from: University of Wisconsin Cooperative Extension, University of Missouri Extension, Pennsylvania State University Cooperative Extension Service

Weed Management After a Flood

STRATEGIES FOR THIS YEAR AND NEXT

Floods can affect weeds both the year they occur and in subsequent years. The biggest impact in the flood year will be the reduced competitive ability of the crop. Weeds will take advantage of the stunted or killed crops and grow to maturity.

In the year after a flood, new weed problems will be likely. Some of the weeds carried into the field by floodwaters may not have germinated in time to be noticed during the previous growing season. Mechanical and chemical methods need to be considered in both the flood year and subsequent years to manage weeds. A bioassay test—in which seeds are planted in flooded and non-flooded soil samples—can be helpful to determine if soils are safe for intended crops.

IF THE CROP RECOVERS

If the crop recovers after the flood, make an effort to reduce the impact of weed competition. This may not be practical if fields are too wet to enter for mechanical or chemical weeding.

- Check fields regularly to monitor crop and weed development. Take note of weed species. Are there any new species? This may happen if weed seeds were carried into the field by floodwater. Make a field map of these weed locations and use it to plan next year's weed management program.

- Consider whether herbicides can be safely applied. Most labels clearly specify the maximum growth stage of the crop at which the product can be used. Applications following a mid-season flood are very likely beyond this “window” of application timing. Most labels also caution against using herbicides if the crop is under any stress. Thus, the feasibility of herbicide use the same year as a flood occurs is limited.

- If herbicide use is feasible but conditions are extremely wet, consider using a commercial sprayer equipped with flotational tires.

WHEN CROPS ARE DAMAGED

Flooding usually kills the crop or at least injures it so severely that it will not be be worth harvesting. If this is the case, try to prevent weeds from going to seed through the use of mowing, tillage or chemical application.

- As mentioned above, take note of any new weed species that are present. Make a field map of the weeds to plan next year's weed control program.

- Mowing will allow some weeds to survive but may hasten drying of the soil more than using herbicides. Mowing is also an option if the soil is too wet to be tilled.

- Mechanically tilling the soil, if it is dry enough, will destroy weeds. It will also aerate the soil more than either mowing or spraying.

- Applying non-selective, non-residual herbicides may be a good option if the soil is too wet to work mechanically.

- Repeat either mowing, tillage or chemical application if another generation of weeds emerges that will have time to produce seed.

FINAL DECISIONS

Should you allow even more time than product labels specify before planting rotation crops? Probably not if you have used DNAs (as noted in chart), but it's difficult to say for other chemicals. Consider whether floodwaters brought in untreated soil from other fields. Also consider whether runoff removed a significant part of the applied product. When in doubt, use the bioassay test described at right or send a soil sample to a commercial lab for chemical analysis. In some cases it may be appropriate to allow an extra week or two beyond the normal plant-back interval and deep till the field to dilute any remaining residues.

Once the field has been planted, monitor it carefully for possible weed problems. If weed densities approach the economic threshold, use the appropriate mechanical or chemical measures to control them.

Additional resources:

Your county agricultural agent

THE YEAR AFTER THE FLOOD

Be alert for new weed problems the year after the flood. Some weeds may have germinated after you made an assessment of weeds during the flood year. Others may have remained dormant until this season. The flood may also have deposited soil that is different in texture, pH and organic matter content. These factors may influence herbicide performance and crop safety. Take soil samples and base herbicide selection and rates on current soil characteristics.

The “new soil” may have herbicide residues from the previous season's application. These levels are unlikely to affect this year's crop, but it would be wise to do a simple bioassay test to determine if planned crops are feasible in the flood-deposited soil. To carry out a bioassay test:

- Take several soil samples from the flooded field (1 quart per sample) and plant three or four seeds of the planned crop in each one.
- Collect soil samples from a known herbicide-free site to use as a standard and likewise plant three or four seeds of the planned crop.
- Grow the seedlings for two to four weeks.
- If plants in the flooded soil are normal and appear to grow as well as those in the herbicide-free soil, indications are strong that it is safe to plant your crop.
- If crop growth in the flooded soil is abnormal, have an agricultural professional determine if the symptoms are related to possible herbicide residues in the soil or to other causes, such as nutrient deficiencies or diseases.

A CLOSER LOOK AT HERBICIDES

Herbicides decompose in the soil by microbial action. This breakdown is slowed under flooded (anaerobic) conditions. Soil temperatures also are cooler under flooded and wet soil conditions, slowing both microbial and chemical degradation. Thus, the potential for herbicide carryover that would injure the subsequent crop may increase after flooding. A summary of possible effects of flooding on herbicide breakdown is given below:

Product or Chemical Family	Degradation Under Anaerobic Conditions
Triazines (atrazine, Bladex, Sencor)	slower
Thicarbamates (Eradicane, Sutan+)	slower
DNAs (Treflan, Prowl)	faster
Acetanailides (Lasso, Dual, Frontier)	can degrade anaerobically
Substituted ureas (Lorox)	unknown
Roundup	can degrade anaerobically
Accent and Beacon	unknown
Hoelon	much slower
Poast, Fusilade, Assure	unknown

Information from: University of Wisconsin Cooperative Extension
University of Wisconsin-Extension • Cooperative Extension

d r o u g h t

Drought Preparedness and Response

STRATEGIES FOR FARMERS

Of all natural disasters, drought is the most gradual and hard to predict. Once it has affected crop growth, farmers and producers enter a new territory of what if's. What if it rains next week? What if it doesn't rain for a month? Alternative crops may have to be planted or crop loss assistance applied for. If feed supplies are low, herds may have to be culled and/or feeds purchased. For farmers who were already facing financial hardship, a drought can force major decisions about diversification, irrigation, surviving a major loss or even selling the farm.

The fact that Wisconsin suffered record droughts as recently as 1976-77 and 1988 underscores the fact that droughts are a natural occurrence. Fortunately, farmers can take some actions to better prepare for and survive a drought. The key is a combination of sound farmstead planning and sound decision-making, based on advice and up-to-date information from resources like your Cooperative Extension Service.

BE PREPARED

- *Examine your water use efficiency and irrigation needs.* If you already irrigate, contact your agricultural agent about using the Wisconsin Irrigation Scheduling Program (WISP). This research-based program assists growers in determining frequency and amounts of irrigation (if any) throughout the growing season; it can be extremely helpful during a drought. If you do not currently irrigate, consult with your agricultural agent and irrigation system dealers now — before a drought occurs. Emergency irrigation systems are difficult to put in place because of the permitting process (which may take 30 days or more) and possible lack of equipment mid-season (dealers generally sell equipment during the winter and spring). Look carefully at irrigation systems as a long-term investment.

- *Keep up-to-date forage inventories.* Accurate forage inventories in silos, hay mows and other storage areas help you determine feed supplies during a drought. Note the amount and accessibility of each lot of uniform quality forage. Your local feed representative or agricultural agent can assist you with this process.

- *Consider alternative on-farm related businesses (AOFRB).* Diversification can be a good long-term approach to revenue shortfalls from drought. Some potential businesses include:

  a) Alternative crops such as shiitake mushrooms, ginseng, specialty vegetables, greenhouse plants, dried and/or cut flowers, etc.
  b) Alternative livestock, such as llamas, ducks, bees, deer for venison or mink.
  c) Forestry, including cord wood, maple syrup, apple orchards and Christmas trees.
  d) Non-production farm-related ventures such as camping, fee hunting/shooting preserves, trout ponds, farm vacations, bed and breakfast establishments, summer camps on the farm, herd sitting, boat and camper storage, and farm markets.
  e) Home-based enterprises including sewing projects, crafts, catering services, upholstery, secretarial service/word processing, taxidermy, etc.

Contact your Cooperative Extension office or your Small Business Development Center for more information.

more information ▸

AFTER A DROUGHT

♦ Financial issues. Continue to pursue government drought assistance programs if you have not yet received relief; your county Extension office can help you through the application process. Also, see your accountant about tax issues related to the drought. If you received federal disaster payments, you may be able to postpone reporting them on your income taxes for a year. Likewise, if you sold livestock because of the drought, you may be able to postpone reporting gains on the sale for as long as two years afterward.

♦ Crop testing for feed. Nutritional values of crops are often affected by drought. Have fresh forage tested for high nitrate levels and nutritional value. Have oats and barley tested for nutritional value; nitrates usually are not a problem. Consult with your livestock nutritionist about corn quality and use. Test for mycotoxins in grain fields.

♦ Soil testing. Because of the potential for herbicide and fertilizer carryover, soil testing is very important following a drought year. See the fact sheets "Fertilizer Application After a Drought," and "Herbicide Concerns After a Drought Year," for test recommendations.

Additional resources:

Your county agricultural agent

DURING A DROUGHT

- *Discuss financial and feed assistance in the early phase of a drought.* The earlier you enroll in feed assistance or financial assistance programs, the sooner you will be eligible for help. See your county agricultural agent about eligibility for grants, loans and other types of assistance. Likewise, contact your lender about potential problems before you are in over your head. You may be able to renegotiate current payment plans and establish an emergency plan if the drought persists and additional financing is needed.

- *Look to your county agricultural agent for up-to-date information on managing during a drought.* As part of a network of county, state and national research and field experts, your agent receives new informa-tion daily on managing during a drought. If your agent doesn't have the answer to your question, he or she can find the answer or refer you to the person for help.

- *Adjust fertilizer rates.* If you haven't already applied fertilizers, adjust your rates based on lower yield expectancy for the drought year. If little or no production is expected, consider skipping an application.

- *Be prepared to use mechanical weed control.* Many herbicides lose effectiveness during dry periods, making mechanical weed control your second line of defense against weeds.

- *Protect livestock from heat.* Adequate water, shade and ventilation in buildings are critical during hot, humid weather . Consider letting livestock out of buildings to cool them at night. Call a veterinarian if heat stress is a concern.

- *Consider alternative crops.* If your fields have less than 12 alfalfa plants per square foot or a 75 percent reduction in corn stand population, consider alternative forages. Some possibilities include sudangrass, sorghum-sudan hybrids, milage and millet. Corn silage might be the best forage alternative; even the worst fields have silage potential. Discuss possible options with your agricultural agent.

- *Cull unprofitable cattle.* If forage is inadequate, selling unprofitable livestock may be your next best move. Consider culling the bottom 5 to 15 percent. Review your options and the economics of the situation with Extension agents.

- *Recognize the early warning signs of emotional stress.* Stress can overwhelm farmers and their families. Some of the warning signs of severe stress include anxiety, depression, anger, violence and withdrawal. If you see these signs in yourself, a family member or friend, get outside assistance. Professional counselors, a clergy member or social worker can help, as well as the Farmers Assistance Hotline for Wisconsin at (800) 942-2474.

Information from: University of Wisconsin Cooperative Extension
University of Wisconsin-Extension • Cooperative Extension

Protecting Livestock From Heat

STRATEGIES FOR FARMERS WHEN TEMPERATURES CLIMB

When temperatures and humidity begin to rise in Wisconsin, keep a close eye on livestock. Temperatures in the high 80s and the 90s can cause problems, as well as a 75 degree F. day coupled with high humidity. Heat stress can cause general discomfort, decline in animal performance and animal death.

PROVIDE SHADE AND NIGHT-TIME COOLING

- *If animals are kept outside, provide shade during hot weather.* Heat from the sun is a major culprit in overstressed animals.
- *Swine may sunburn during hot, sunny weather.* Try to keep them out of the sun. Sun shades can cut the radiant heat load by as much as 40 percent; ask your county Extension agent for information on their construction. Pasture wallows are also effective for sunburn protection and wet skin cooling.
- *Turn cows outside at night to cool them and cool the barn.* Since animals cool themselves primarily through breathing, barns tend to get warm and humid quickly.

PROVIDE ADEQUATE WATER

Ample drinking water is vital to animals during hot and humid conditions. Animals cool themselves by panting (water loss from the lungs) and through water evaporation from the skin. Increased respiration during hot weather is especially important for pigs and other animals that do not sweat. Animals must replace the water loss to cool themselves.

- *Maintain access to water.* Provide automatic drinking cups so animals can meet their requirements during hot weather.
- *Keep water containers clean.*
- *Adjust the drinking space for the size and number of animals in the pen or group.* Excessive volumes of water grow warm and stale throughout the day. (See the fact sheet “Livestock Water and Nutrition.”)
- *Check the water delivery systems periodically for plugs or other problems.*
- *If necessary, spray water on animals to cool them.*

PROVIDE GOOD VENTILATION

Proper ventilation helps maintain livestock health during hot and humid weather. Without adequate air exchanges and airflow distribution within livestock buildings, heat and moisture accumulate and animal production is affected. Contact a ventilation specialist to inspect and update your system, if necessary. Your county Extension office also may be able to help you.

BE WATCHFUL

- *Use the temperature humidity index as a guide to heat stress.* Listen to local or regional weather reports for the temperature humidity index (THI) for your area. Some levels of concern include:

  a) Above 75 THI - Heat stress on high-producing cows begins to decrease feed intake and lower milk production.
  b) Above 80 THI - Severe heat stress may occur for cows on pasture. Shade and adequate ventilation are essential to minimize milk loss.
  c) Above 83-85 THI - Danger of fatal heat stress occurs.

- *Keep an eye on animals.* If heat stress is a concern, check animal temperature. Dairy cow temperatures approaching 104 to 106 degrees F. are dangerous. At 107 degrees F., spontaneous heart failure is possible. Call a veterinarian and use methods listed above to keep animals cool.

Additional resources:

Your county agricultural agent,
ventilation specialists, your veterinarian

Related publications:

UW-Extension publications–

"When Temperatures Go Up, Does Your Milk Production Go Down?" (A2881);

"Cooling Swine," (PIH87).

Midwest Plan Service publications–

"Heating, Cooling and Tempering Air for Livestock Housing," (MWPS-34);

"Mechanical Ventilating Systems for Livestock Housing," (MWPS-32).

Information from: University of Wisconsin Cooperative Extension
University of Wisconsin-Extension • Cooperative Extension

Managing Livestock During a Drought

WHEN WATER AND FEED SUPPLIES BECOME A CONCERN

Drought usually gets its reputation from its impact on crops. But its impact on livestock can be equally dramatic. Hot, dry weather increases the water needs of livestock but often decreases water supplies. Crops may not yield as planned, causing a feed shortage. Consequently, farmers may face special challenges, including decisions about whether to buy feed or sell livestock.

WATER REQUIREMENTS

Water requirements may increase to double the normal intake for animals during hot weather. Clean, fresh water is important. If animals do not meet their water needs, they may refuse to eat, experience lowered production, become sick or die.

Water supplies also may become a problem as the drought wears on. Wells and piping may be inadequate if water demand increases dramatically; shallow wells and streams may dry up. You may need to transport water. Contact your local emergency government office or your county Extension office for information on water supply assistance.
Some general water estimates for various conditions and animals:

- *Daily water intake for beef cattle at 88 degrees F.:*

  a) Cows -16.5 gallons for nursing calves; 14 gallons for bred dry cows and heifers.
  b) Bulls - 18 gallons.
  c) Growing cattle - 9 gallons for 400 lb. animal; 12 for 600 lb.; 14 for 800 lb.
  d) Finishing cattle - 14 for 600 lb. animal; 17 for 800 lb.; 20 for 1,000 lb.; 22.5 for 1,200 lb.

- *Daily water intake for dairy cattle at 80 degrees F.:*

  a) Dry cows (for maintenance and pregnancy) - 16.2 gallons for 1,400 lb. animal; 17.3 for 1,700 lb.
  b) Lactating, 1,400-lb. cows (for maintenance and milk production) - 17.9 gallons for 20 lb. milk production; 24.7 for 60 lb. milk production; 38.7 for 80 lb. milk production; 45.7 for 100 lb. milk production.
  c) Heifers - 3.3 gallons for 200 lb. animal; 6.1 for 400 lb.; 10.6 for 800 lb.; 14.5 for 1,200 lb. (for maintenance and pregnancy).

- *Average daily water intake for swine:*

  a) Breeding herd - 2 to 3 gallons for gestating sows and boars; 4 to 5 gallons for lactating sows.
  b) Young pigs - One-half to 1 gallon for weaned pigs (15-50 lb.); 1 gallon for growing pigs (50-120 lb.); 1.5-2 gallons for finishing pigs (120 lb. to market).

Increase amounts for hot, dry conditions.

WHEN FEED BECOMES AN EMERGENCY

Feed supplies may run low if crops are compromised or lost because of dry weather. Farmers unable to afford additional feed may face an emergency situation. Some considerations include:

- *Develop an inventory of livestock numbers and feed supplies.* An inventory will help you plan for current and long-term feed needs.

- *Get advice and assistance.* When a feed shortage is imminent, contact a nutritionist or your county Extension office for guidance, your lender for early discussion of potential problems or needs and the Agricultural Stabilization and Conservation Service (ASCS) for feed assistance program information.

- *Two major options when facing a feed shortage are to:*

  a) Buy or obtain additional feed. Feed assistance may be available from relief groups, the ASCS or through loans. Volunteer organizations typically offer hay lifts during drought years. Contact your county Extension office for more information.
  b) Sell non-essential animals. The money received can help buy additional feed for remaining animals.

- *Plant alternative crops for forage.* A number of crops, including 70-day corn, buckwheat and millet, may be planted mid-summer to offset early losses. (See the fact sheet “Alternative Crops During a Drought.”)

- *Talk about it.* Drought can bring feelings of great anger, frustration and hopelessness to farmers, especially for those already experiencing tough financial times. It's critical that producers talk about the stress they are feeling, rather than isolating themselves from family or neighbors. In some cases, intervention may be needed to connect farmers with counselors, clergy members or other professionals. (See the fact sheet “Identifying Stress in Family and Others.”)

Additional resources:

Your county agricultural agent; your county family living agent; the Agricultural Stabilization & Conservation Service; your local lender; Farmers Assistance Hotline (for Wisconsin farm families), (800) 942-2474); health and human service workers; financial and legal assistance agencies

Related publications:

UW-Extension video “Managing During Tough Times,” (VB0052).

Information from: University of Wisconsin Cooperative Extension
University of Wisconsin-Extension • Cooperative Extension

Tillage During a Drought

WHAT TO DO — AND NOT TO DO — WHEN SOILS ARE DRY

The best advice on tillage during a drought may be: avoid it. When soils are dry, you should do everything you can to conserve remaining moisture. This may mean holding off on plowing, disking and cultivating so as not to disturb soils and let moisture escape in the process. Keep in mind that any operation that brings soil up to the surface may worsen conditions.

The guidelines at right offer some general considerations. For advice specific to your crops and drought conditions, contact your county Extension agent.

GENERAL GUIDELINES

- *Minimum tillage.* Try to use minimum tillage techniques if possible. These will leave crop residue from the preceding year on the surface, thereby reducing evaporation of moisture from the soil. Conservation tillage may be a particularly good method because it leaves more than 30 percent of the residues, such as old cornstalks, in fields after planting.

- *Weed control.* Use chemical weed control, rather than tillage, to manage weeds. With chemical weed control, you avoid disturbing the soil and causing moisture loss.

- *Planting.* While it helps to plant in the moist soil below the dry surface, don't plant beyond the maximum recommended depth for your crop.

- *Tilling.* If you must till, keep it at a shallow level. For example, when field cultivating, use a depth of 2 to 3 inches, rather than 4 to 5. Do not subsoil.

- *Chisel plowing.* If using a chisel plow, use sweeps instead of twisted shovels on it. The sweeps bring up less soil, while leaving more crop residue on the soil surface. As a result, less moisture is lost from the soil.

Additional resources:

Your county agricultural agent

Related publications:

UW-Extension publications–

“Planting for Conservation Tillage,” (A3396);

“Row Crop Cultivators,” (A3483);

“Optimum Corn Planting Practices,” (A3264);

“Conservation Tillage for Corn,” (A3091);

“Making Conservation Tillage Work for Corn Production on Your Soil Type,” (A3386);

“Managing Drought-Stressed Corn and Soybeans,” (NCR238).

Information from: University of Wisconsin Cooperative Extension

Irrigation During a Drought

CONSIDERATIONS FOR NON-IRRIGATING FARMERS

Drought conditions are great anxiety producers, especially if you don't normally irrigate your crops. As painful as it may be, however, the best advice for non-irrigators is often to wait things out during a drought. While some irrigation equipment may be available on an emergency basis from dealers or area irrigators, the permitting process for surface water or groundwater sources can take well over a month. Furthermore, the manpower, training, and financing needed to develop an irrigation system make it unrealistic as a short-term solution. Running an irrigation system can be a full-time job in itself, one that can take three years to master, and one that may take ten years to pay off through increased production.

One thing you can do is realistically evaluate whether an irrigation system makes sense for you in the the long run. Follow the guidelines at right to make this determination and to understand the processes involved in setting up an irrigation system.

DO SOME RESEARCH

Consider irrigation in relation to your type of crops, soil, water availability, time and farm budget. Irrigation systems have become increasingly sophisticated—something that makes them more valuable in terms of productivity, but also more of a commitment in terms of time, management and financial investment. Discuss the matter with your county Extension office, other irrigators and equipment dealers.

- *Collect information on your soils and local climatic conditions.* If you have a sandy soil with lower water-holding capacity, for instance, an irrigation system can make a significant difference in crop yields. You can get a county soils report from the local USDA Soil Conservation Service office, county Extension office or Land Conservation department.

- *Examine the types of crops you currently grow for root depth and therefore, water needs.* You want to be sure that irrigation equipment costs will be offset by an increase in yields or quality of crop. You should also consider the possibility of growing higher value crops (using irrigation) such as potatoes, strawberries, sweet corn, dry beans, snap beans, cucumbers, potatoes and carrots. Are they realistic for your soil type and climatic conditions?

- *Consider water sources.* Contact the Wisconsin Geological and Natural History Survey for information about groundwater sources for your area. See the section below for guidelines regarding surface water.

- *Talk to irrigation equipment dealers about irrigation systems and what might be appropriate for your current or future needs.* Topography and field size are two of many factors affecting system needs.

- *Consider the economics of irrigation.* Discuss potential yields with other area irrigators as well as your Extension agent. In general, irrigation may more than double yields in a field, and pay for itself within 10 years. Increases may be 75-80 bushels of corn per acre and four tons more alfalfa per acre. However, success with irrigation varies depending upon soils, weather, climate, type of irrigation, etc.

- *Assess your current economic conditions.* Talk to your lenders. Irrigation may not be a good idea right now because of the financial burden. However, it may be something to plan for in the future.

SURFACE WATER AS AN IRRIGATION SOURCE

Surface water diversions generally cover rivers, lakes and streams. Riparian land—land which adjoins these waterways—is the first requirement for irrigators. In order to obtain a surface water diversion permit from the DNR, you also will need:

- A legal description of the land to be irrigated, such as NE1/4 of SE1/4 of Sec. 23, T14N, R10E.
- A waiver from downstream irrigators, hydropower dams, municipal or industrial waste dischargers.
- A "chain of title" test (an abstract examined by an attorney), which determines the acreage of riparian land.
- The proposed diversion, including the maximum pumping rate of the diversion, the maximum acreage to be irrigated (tillable acres), the type of crop, inches of water per irrigation, maximum number of irrigations anticipated per growing season, start and end dates of irrigation per growing season.

GROUNDWATER AS AN IRRIGATION SOURCE

Groundwater diversions are covered by DNR high-capacity well permits. These wells pump 70 gallons per minute (gpm) or more. Contact a local well driller of the DNR District water manager to initiate the permitting process.

For a well permit, you will need:

- General information on water needs, property ownerships, location and operator.
- Design information, including a well driller's report and pump information.
- A DNR site inspection for local contamination.

IRRIGATION EQUIPMENT

Irrigation equipment dealers can be very helpful in assessing your needs and potential for irrigation. Equipment ranges from large-volume traveling sprinklers which can cover 100 acres in a week to center pivots which water up to 133 acres in two days. The supply of equipment is somewhat limited during the growing season. Most equipment is sold and delivered during the winter and early spring. Keep this in mind as you begin irrigation system planning.

Additional resources:

Your county agricultural agent, equipment dealers, the Department of Natural Resources, the Wisconsin Geological & Natural History Survey

Related publications:

UW-Extension publication–"Irrigation Management in Wisconsin—the Wisconsin Irrigation Scheduling Program," (WISP), (A3600).

Information from: University of Wisconsin Cooperative Extension
University of Wisconsin-Extension • Cooperative Extension

Fertilizer Application After a Drought

CONSIDERATIONS FOR THIS YEAR AND NEXT

Generally, fertilizer application is not much of an issue during a drought year. Fertilizers often have been applied before the true extent of a drought is known. If they haven't already been applied, you need to adjust rates based on lowered yield expectancy for the drought year. If little or no production is likely, it may be best to skip an application.

Fertilizer use does become a significant issue the year after a drought, however. Low crop yields during the drought year mean that significant amounts of unused nutrients could remain in the soil at the end of the growing season. Where nutrient carryover is substantial, fertilizer needs for the following year are likely to be affected. Several methods are available to help growers determine nitrogen, phosphorous and potassium carryover and current needs.

PHOSPHOROUS AND POTASSIUM CARRYOVER

If phosphorous or potassium was applied but not used because of lower than expected yields, it usually remains in the top few inches of soil. It will not be lost over the winter. Therefore, the unused portion can be credited against nutrient needs for next year's crops.

- *A formula for determining carryover.* One method for estimating unused phosphorous and potassium is based on the ratio of the actual drought-year yield and the yield goal used to determine nutrient applications that year. For example:

Drought year application	= 75 lb./acre phosphate = 300 lb./acre potash
Drought year yield goal	= 6 tons/acre (alfalfa)
Actual yield	= 2 tons/acre
Actual yield/yield goal	= 2/6 = 1/3
Therefore, 2/3 of drought-year application is unused	
Estimated carryover	= 2/3 x 75 lb./acre = 50 lb./acre phosphate = 2/3 x 300 lb./acre = 200 lb./acre potash

Comparison of the actual yield with the expected yield shows that the drought-year yields were 1/3 of the goal. Under the assumption that nutrient removal is proportional to yield, approximately 2/3 of the phosphate and potash applied in the drought year was not used and likely will be available to the next crop.

- *Soil tests.* Routine soil tests also can be used to determine the current levels of available phosphate and potash, and to obtain fertilizer recommendations. They are useful for detecting carryover where relatively large amounts of nutrients were applied in the drought year, such as in topdress maintenance fertilizer programs for alfalfa. Relatively small amounts of carryover, such as those that could occur following application in a maintenance program for corn, might not be detected. The tests may be done in spring or fall.

NITROGEN CARRYOVER

Following a drought year, most nitrogen carryover exists as nitrate in the plant root zone. However, the possibility of overwinter loss of residual nitrate makes estimation of carryover more difficult than for phosphorous

SOIL TESTING LABS

Soil testing and analysis are available from the University of Wisconsin soil testing labs in Madison and Marshfield, and other private soil testing labs. Your county Extension office can provide names and locations of commercial labs performing these tests in your area, as well as more specific sampling instructions and forms. To contact the Madison and Marshfield labs:

Soil & Plant Analysis Lab
5711 Mineral Point Road
Madison, WI 53705-4453

phone: (608) 262-4364

State Soil & Forage Lab
Marshfield Ag Research Station
8396 Yellowstone Drive
Marshfield, WI 54449

phone: (715) 387-2523

Additional resources:

Your county agricultural agent, soil testing labs, fertilizer dealers, crop consultants.

Related publications:

UW-Extension publications–

"Wisconsin's Preplant Soil Nitrate Test," (A3512);

"Sampling Soils for Testing," (A2100);

"Step-by-Step Guide to Nutrient Management," (A3568);

"Nutrient Management Practices for Wisconsin Corn Production and Water Quality Protection," (A3557).

and potassium. The amount of residual nitrogen in the soil at the end of the growing season must be considered, as well as factors affecting overwinter loss. Specifically, nitrogen carryover is likely where:

- *The drought-year crop was corn or a non-legume.*
- *The crop received moderate to high amounts of nitrogen as fertilizer or as legume or manure nitrogen credits.*
- *Yields were below expected levels.*
- *Soils are silt loam or heavier-textured.*
- *Overwinter precipitation amounts are normal or below normal.*

TESTING FOR NITROGEN CARRYOVER

A preplant soil nitrate test should be used to determine how much nitrate has remained in the soil until the next growing season.

- *Sample in the spring.* Soil samples should be collected in the spring after the frost has left your fields and before preplant applications of nitrogen fertilizer.
- *Collection methods.*

  a) Take at least 15 random soil cores from uniform soil areas no larger than 20 acres.
  b) Take separate samples from areas with soil or management practice differences.
  c) Sample in 1-foot increments to a depth of 2 feet.
  d) Each sample should be placed in a clean container marked for the appropriate depth.
  e) Thoroughly mix the soil from each depth and collect a 1-cup subsample. This sample should be sent to a soil testing lab for analysis.

- *Air dry or freeze samples.* Do not store or send composite samples to the lab in moist condition. If samples can't be taken to the soil testing lab within one day after collection, they should be air-dried (by spreading on clean paper for 24 to 48 hours) as soon as possible. Another option is to freeze your samples immediately after collection and then either transport them to the testing lab while still frozen or air-dry the samples before shipment.
- *Provide background information.* The soil testing lab needs to know if you applied manure to your sampled fields or if the previous crop was a legume.
- *Provide the soil name.* The name of the predominant soil and its organic matter content within the sampled area is needed.

Weed Management During a Drought

HERBICIDE EFFECTIVENESS AND MECHANICAL MEASURES

Dry weather after planting causes many concerns, including the impact of weeds on annual crops. Many herbicides lose effectiveness during dry periods; growers who use herbicides on corn and soybean crops are likely to be affected. Fortunately, an awareness of herbicide effectiveness and the aggressive use of mechanical weed control measures can make a difference.

SOIL-APPLIED HERBICIDES

- *Preplant incorporated herbicides.* These are applied before planting and mixed into the soil. They work best when:

  a) the product is mixed uniformly with soil to the depth recommended by the manufacturer;
  b) soils have reasonable moisture levels after incorporation has been completed.

If the soil is only slightly dry, incorporated herbicides generally perform adequately. Seldom is it so dry early in the season that incorporated treatments fail. In a true drought, however, they may not give acceptable weed control. Therefore, be prepared to cultivate if weeds appear.

- *Pre-emergence herbicides.* These depend totally upon rainfall after applications to "activate" the product. Rainfall positions the chemical in the upper soil surface where the weed seeds germinate; there is no chemical change as perhaps the term "activate" suggests. To obtain adequate herbicide activity, however, rain must fall within 10 to 14 days after the seedbed was prepared. Without such precipitation, pre-emergence herbicides generally fail to give acceptable weed control even if a true drought does not develop. Therefore, mechanical weed control may become critical within weeks of planting. Two examples:

  a) If a field is prepared to plant on April 30, corn is planted on May 1 and a pre-emergence herbicide is applied on May 2, rainfall of at least one-quarter to one-half inches is needed within 10 to 14 days to assure adequate performance. If rainfall does not occur by May 12, the grower should begin rotary hoeing.
  b) If a field is prepared on April 30 and corn is planted on May 10, followed by pre-emergence herbicide on May 11, plan to rotary hoe on May 12 unless rainfall is very likely in the immediate future.

As illustrated above, when planting and spraying are close to the field preparation time (example a), there is more time to get the needed rainfall to make a surface-applied herbicide perform adequately. As time between field preparation and spraying increases (example b), there are fewer days after an application to get a timely rain. Thus, rotary hoeing becomes necessary sooner.

ROTARY HOEING

Rotary hoeing kills weeds that have germinated but have not yet emerged. These weeds are in the "white root" stage of development. After weeds emerge, rotary hoeing is less effective. Rotary hoeing also helps place the herbicide in the upper soil surface so that when rains do fall, the herbicide is in a better position to be quickly taken up by weed seedlings and hopefully kill them. If it has not rained within seven days of the first rotary hoeing, make a second pass with the rotary hoe to kill the next generation of weeds.

POST-EMERGENCE HERBICIDES

Post-emergence herbicides also may fail in dry weather. These treatments work best when weeds are actively growing. When weeds are stressed by lack of adequate soil moisture, chemical control declines. If you decide to apply post-emergence herbicides under very dry conditions, be aware that crop injury may occur and weed control will be poor.

CULTIVATION

In all situations, be prepared to cultivate once or twice following rotary hoeing. Some growers mistakenly believe that soil loses more moisture when cultivated. But remember that weeds transpire water into the atmosphere every day they are in the field; the longer weeds live, the more soil moisture is lost and unavailable for the crop, and the harder they are to eradicate. So it is always a wise decision to cultivate weeds early on.

- Cultivate when the weeds are relatively small and the crop is large enough (at least 4 inches tall) to allow you to roll some soil into the row without covering the crop.
- The crop should be at least three times as tall as the weeds when the first cultivation is done (for example, the crop is 6 inches tall and the weeds are 2 inches or less tall). This way, the weeds in the row can be covered with minimal effect on the crop.
- The cultivator need not be set any deeper than a couple of inches to dislodge the weeds; little if any moist soil will be brought to the surface.
- A second cultivation can be done when the crop is 14 to 18 inches tall. This requires timely mechanical practices, but keep in mind that in drought years, a few uncontrolled weeds cost more in reduced yield than in years with ample moisture.

Additional resources:

Your county agricultural agent

Related publications:

UW-Extension publication "Reduced Herbicide Rates: Aspects to Consider," (A3563).

Information from: University of Wisconsin Cooperative Extension
University of Wisconsin-Extension • Cooperative Extension

Alternative Crops During a Drought

MEETING FORAGE AND GRAIN NEEDS IN AN EMERGENCY

Alternative crops can be a major concern during a drought. If planting was postponed or plants didn't survive because of drought, mid-summer planting may be necessary for adequate forage or grain. You also may be concerned about feed supplies for next year and, therefore, wish to plant additional crops this fall.

Unfortunately, no one can predict the longevity of a drought. But you do have options, and the knowledge that planning ahead is always a good idea.

ALTERNATIVE FORAGES FOR THIS YEAR

Before giving up on existing crops, examine your current crops for silage potential. Corn, for example, may be the best forage alternative available. Also, keep in mind the added labor and cost of establishing alternative crops. Unfortunately, there is no guarantee regarding yield or quality of alternative forages.

- *Existing crops as alternative forages.* Test these forages and use the data to obtain efficient use through balanced rations:

  a) alfalfa, red clover, trefoil
  b) corn and soybeans
  c) peas or canning crops
  d) small grains
  e) grasses

- *Summer-seeded crops.* These generally should be seeded by July 15 and only if moisture is available for germination and emergence. Crops include:

  a) sudan, sorghum-sudan and forage sorghum
  b) hybrid pearl millet
  c) soybeans (alone or mixed with sorghum-sudan)
  d) 70-day corn
  e) brassicas - forage rape, turnips
  f) millets - common, German, foxtail or Japanese
  g) buckwheat
  h) winter grain with field peas. These should be planted from mid- to late-August.

- *Alternative cash crops.* If you planted cash crops such as wheat or corn, but drought is causing problems, you may decide to replant. Some good alternatives are buckwheat and millet, which can be planted in July. These are very short season crops and both are high in fiber. Consider whether you have a market to sell these two crops or whether you can feed them to livestock.

MEETING DEMANDS FOR NEXT YEAR

- *Spring grains.* If moisture is available for germination and emergence, you can plant spring grains like wheat, oats or barley in August. These can be harvested until a hard freeze, which usually occurs in late October.

- *Winter rye and winter wheat.* For the earliest harvest of forage next spring, plant winter rye in September. It can be harvested mid-May. Another alternative is winter wheat, which has a higher forage yield but must be harvested seven to ten days later.

REDUCING THE RISK OF DROUGHT STRESS

The only sure method to avoid drought-stressed crops is to use irrigation. Other management practices, however, can help reduce the risk of drought stress.

- *Early planting.* By planting early, you increase the chance of having pollination completed before the driest part of the season.

- *Optimum fertilization.* Proper fertilization will promote healthy plant growth and efficient moisture utilization, essential for high yields in both normal and dry years.

- *Adequate weed control.* Weeds compete with crop plants for water, so controlling weeds will provide more water for the crop.

- *Residue management.* By maintaining a cover of residue through conservation tillage or no-till, you can reduce the amount of evaporation from the soil surface and conserve water for the crop's use.

Additional resources:

Your county agricultural agent

Information from: University of Wisconsin Cooperative Extension, Purdue University Cooperative Extension Service
University of Wisconsin-Extension • Cooperative Extension

Salvaging Drought-Stressed Crops

ANALYZING NUTRITIONAL VALUE AND SAFETY

Drought-stressed crops may often be salvaged, but testing for nutritional value and harmful substances is extremely important. Nitrate toxicity and aflatoxins may be a problem in drought years. Depending on test results, feed amounts need to be adjusted for animal nutrition and safety.

FRESH FORAGE Versus SILAGE

If plants show signs of drought stress, be careful about using them as fresh forage because nitrate levels may be high. A better option is to use plants as silage, because the silage fermentation process reduces nitrate levels. In either case, testing is critical for safe feeding.

Symptoms of nitrate poisoning in livestock include labored breathing, frothing at the mouth and a brownish color of the nonpigmented skin within a few hours after feeding. Abortions can occur; death may occur within an hour in extreme cases.

- *Silage should be stored at least three weeks before testing and feeding take place.*
- *Testing is available from private companies and state universities.* Contact your county Extension agent for a list of laboratories.
- *Have both a nutritional analysis and nitrate test completed on crops.* Results will take longer for nitrate tests.
- *Test results will help you determine safe feeding amounts, as well as the need for grain and protein supplements.*

OATS, BARLEY AND CORN

- *Test drought-stressed oats and barley for nutritional value.* They often are reduced to empty hulls or a very light grain. The result is low energy and protein and a limited feeding value for poultry and swine. Oats and barley may work well in combination with beef and other livestock feeds.
- *Consult with your livestock nutritionist or agricultural agent about corn use.* Corn quality usually is not a concern during drought; corn kernels may be smaller, but feeding value is not affected to the same degree as for oats and barley. Ear corn, however, may be lower in nutritional value due to a higher cob to kernel ratio.
- *Test for aflatoxins in grain fields.* The fungus, Asperilla flavus, and certain other molds may produce toxic substances in the field and in storage. They historically have been a problem in southern states where severe drought and high temperatures more commonly are experienced. Contact your county agricultural agent for a list of qualified laboratories.

Additional resources:

Your county agricultural agent

Related publications:

UW-Extension publications–

“Managing Drought-Stressed Corn and Soybeans,” (NCR238);

“Protect Livestock From Nitrate Poisoning,” (A1889);

“Feeding the Dairy Herd,” (NCR346).

Information from: University of Wisconsin Cooperative Extension

Herbicide Concerns After a Drought

ACCOUNTING FOR CARRYOVER IN NEXT YEAR'S CROPS

When soils are moist during the growing season, herbicides break down through microbial and chemical processes. These reactions may be slowed greatly in drought conditions. If herbicide residues are significant, they may injure rotational crops in the following season. For this reason, growers need to be aware of herbicide residues and take steps to decrease risk of injury.

HERBICIDE CARRYOVER LEVELS

Herbicides vary greatly in soil persistence and carryover to next year's crops.

- *Essentially no risk.* Herbicides presenting essentially no risk of carryover for next year's crops include: 2, 4-D, Roundup, Gramoxone, Basagran, Poast, Assure, Fusilade, Sutan, Select, Banvel, Clarity, Blazer, Eptam, Eradicane, Lorox, Buctril, Reflex, Cobra, Butyrac, and MCPA.

- *Moderate risk.* Herbicides presenting a moderate risk of carryover to next year's crops include: Sencor, Lexone, Bladex, Treflan, Prowl, Accent, Beacon, Broadstrike, Velpar, Balan, Stinger, Classic, Pinnacle, Lasso, Dual, Frontier, Surpass and Harness.

- *High risk.* Herbicides presenting a high risk of carryover to next year's crops include: atrazine, Pursuit, Scepter, Command and Princep.

AVOIDING RESIDUE PROBLEMS

- *Check the label of herbicides used during the drought season.* It will tell you the normal interval between application and planting for a specific rotational crop. Footnotes frequently show if the risk of carryover is greater under certain conditions (such as soil pH or dry soils).

- *Select this year's herbicides carefully.* Do not choose herbicides or use rates that have significant injury potential by themselves. Do not use products that may interact with carryover levels of last year's products. For example, do not use metribuzin (Sencor, Lexone) in soybeans this year if atrazine was used in corn planted during the drought year.

- *Use tillage.* Tillage will dilute the herbicide, especially if it is concentrated near the surface or in bands over the row.

- *Look for herbicide tolerance.* Select crop varieties or hybrids with greater tolerance to the herbicide used during the drought year. This information is not available for all varieties. Ask your seed supplier for assistance.

- *Use good management practices.* Good seedbeds, proper seeding depth and rate, adequate soil fertility, and insect and disease protection will minimize the effect of herbicide carryover. Many crops can tolerate a single stress relatively well, but two or more stresses can result in significant loss of crop vigor and yield.

TESTING FOR CARRYOVER

If you choose to test for herbicide carryover, the best time to do so is between late October and mid-November for most of Wisconsin. By this time, soil temperatures reach and remain below 50 degrees F., a point at which herbicide breakdown is minimal. Do not take soil samples for residues before this time; they may indicate levels greater than actually present when you plant next year.

- *A bioassay test may be helpful if doubts remain about planting because of possible herbicide residues.* The test will alert you to residue problems by comparing the productivity of your intended crop variety in both affected and unaffected soils. (Follow the guidelines in the UW-Extension publication "A Simple Test for Atrazine Residues.") Begin the test at least three weeks prior to planting so that sufficient plant growth is available to assess carryover potential. The herbicide label may also contain suggestions on running a bioassay test, as well as information on crop rotations and carryover potential.

- *A chemical test for herbicide residues can also be done by private laboratories.* These tests are expensive and the results may not be easy to interpret. However, they may be appropriate in cases where bioassays cannot be done or where high value crops are concerned.

Additional resources:

Your county agricultural agent

Related publications:

UW-Extension publications–

"A Simple Test for Atrazine Residues," (A2882);

"Reduced Herbicide Rates: Aspects to Consider," (A3563);

"Row Crop Cultivators," (A3483).

Information from: University of Wisconsin Cooperative Extension
University of Wisconsin-Extension • Cooperative Extension

Drought Assistance for Farmers

SOURCES OF GRANTS, LOANS AND OTHER ASSISTANCE

When drought conditions take their toll on farmers, government programs and lenders can make the difference. Some, such as the Agricultural Stabilization and Conservation Service, offer feed-grain programs, while others offer grants and loans.

While there admittedly will be some paperwork involved, your efforts will pay off with higher benefits if you apply for a variety of programs early on. Your county Extension office can help determine programs for which you are most qualified. As for your local lenders, start negotiating about potential needs—such as money to buy feed—before drought conditions peak. That way you are not managing in a panic mode and neither are lenders.

Additional resources:

Your county Extension office

ASSISTANCE

- *Agricultural Stabilization and Conservation Service (ASCS) Federal Farm Disaster Assistance.* ASCS offers disaster payments and livestock feed assistance for drought-stressed farmers. If you don't plant any of your crop, you may be eligible for the 0/92 program which provides deficiency payments on 92 percent of a producer's base acreage.

- *Farmer's Home Administration.* FHA offers disaster loans at low interest with affordable repayment terms. It also offers conventional guaranteed loans with low interest rates.

- *Farm Credit Services.* This farmer-owned credit cooperative offers competitive loans to farmers.
- *Commercial banks.* Competitive loans are available to farmers.

- *WHEDA-CROP,* also known as the Wisconsin Housing and Economic Development Authority–Credit Relief Outreach Program. This state program offers farmers low-interest loans originating from banks but guaranteed by WHEDA. See your local lender.

HOW TO APPLY

See your county Extension office about your options for assistance and the enrollment process. In some cases, Extension agents can use a computerized farm assistance program to quickly determine what programs you are most eligible for.

You may need the following items to apply for a grant, loan or other assistance.

- An itemized list of losses with your estimate of the repair or replacement cost of each item

- Copies of federal income tax returns from the last three years
- Insurance policy

- A brief history of your farm and ASCS information on farm crop base and assigned yields

- Personal and business financial statements (income statement and balance sheet), list of bills owed

- Loan repayment schedule

Information from: University of Wisconsin Cooperative Extension, University of Illinois Cooperative Extension Service

Tax Issues After a Drought

GUIDELINES FOR CROP LOSS AND LIVESTOCK SALES

Droughts can wreak havoc for farm families. The good news is that come tax time, you have some options that might make things easier. If you have received federal disaster payments, you may be able to postpone reporting them on your income taxes for a year. Likewise, if you were forced to sell livestock because of the drought, you may be able to postpone reporting gains on the sale for as long as two years afterward.

Here are some basic things you need to know. But for the best advice for your situation, see a tax practitioner knowledgeable about farm tax laws and assistance programs.

CROP INSURANCE PROCEEDS AND DISASTER PAYMENTS

If you are a cash method farmer, you are allowed to postpone reporting insurance and disaster payments on crop losses by one year under Section 451(d) of the tax code. Generally, this rule applies when crops cannot be planted or are damaged or destroyed by a natural disaster such as a drought or a flood. It applies to all insurance proceeds and to federal payments received for losses due to a natural disaster.

- *Qualifying for the election.* You must be able to show that under your normal business practice, the income from the crop would have been reported in the year following receipt of payment for it.

- *Two options for reporting on tax returns.* If you qualify for the exception, you have the option of reporting the payments as income in the year it is received or as income in the following year. Electing to postpone reporting the payment as income covers all crops from a farm. You must file a separate election for each farming business you operate. Separate businesses are defined as those for which you keep separate books and are allowed to use different methods of accounting.

HOW TO MAKE THE ELECTION

The election must be attached to the return (or amended return) for the tax year in which the payment was received. The statement must include:

- Your name and address.

- A declaration that you are making an election under Section 451(d).

- Identification of the specific crop or crops destroyed or damaged.

- A declaration that under your normal business practice, the income from the damaged crops would have been included in your gross income for the tax year following the damage.

- The cause of damage of crops and the dates on which the damage occurred.

- The total amount of payments received from insurance carriers, itemized with respect to each specific crop and with respect to the date each payment was received.

- The names of insurance carriers from whom payments were received.

LIVESTOCK SALES

There are two tax provisions that apply to the sale of livestock because of drought. One allows the taxpayer to roll the gain into the basis of replacement livestock. The other allows the taxpayer to defer reporting the income by one year.

ROLLING GAIN INTO REPLACEMENT LIVESTOCK

If livestock are sold because of drought conditions, the gain realized on the sale does not have to be reported if the proceeds are used to purchase replacement livestock within two years of the end of the tax year of the sale. This applies to livestock (other than poultry) held for any length of time for draft, breeding or dairy (no sporting) purposes.

The new livestock must be used for the same purpose as the livestock that were sold. Therefore, dairy cows must be replaced with dairy cows. The taxpayer must show that the drought caused the sale of more livestock than would have been sold without the drought conditions. The farmer has a basis in the replacement livestock equal to the basis in the livestock sold, plus an amount invested in the replacement livestock that exceeds the proceeds from the sale. In this case, there is no requirement that the drought conditions cause an area to be declared a disaster area by the federal government.

DEFERRING INCOME TO NEXT YEAR

If any livestock are sold because of drought conditions, you may be eligible for another exception to the general rule that the sale proceeds must be reported in the year they are received. This election applies to all livestock. This exception allows the taxpayer to postpone reporting the income by one year.

To qualify, the taxpayer must show that the livestock would normally have been sold in a subsequent year. Additionally, the sale of the livestock must have been prompted by a drought that caused an area to be declared a federal disaster area. It is not necessary that the livestock be raised or sold in the declared disaster area. The sale can take place before or after an area is declared a disaster area as long as the same disaster caused the sale.

THE LIVESTOCK ELECTION

The election to either roll over the gain or defer it to next year is fairly simple. It is made by not reporting the deferred gain on the tax return and by attaching a statement showing all the details of the involuntary conversion including:

- **Evidence of existence of the drought conditions that forced the sale or exchange of the livestock.**
- **A computation of the amount of gain realized on the sale or exchange.**
- **The number and kind of livestock sold or exchanged.**
- **The number of livestock of each kind that would have been sold or exchanged under the usual business practice in the absence of the drought.**

Additional resources:

Your county Extension office; the Internal Revenue Service, (800) 829-3676, for forms; your local emergency government office; income tax preparers

Related publications:

UW-Extension publication, “Income Tax Management for Farmers,” (NCR002).

IRS Publication 225, “Farmers Tax Guide;”

IRS Publication 334, “Tax Guide for Small Business;”

IRS Publication 547, “Nonbusiness Disasters, Casualties and Thefts.”

Information from: University of Wisconsin Cooperative Extension
University of Wisconsin-Extension • Cooperative Extension

t o r n a d o e s

Tornado Preparedness and Response

STRATEGIES FOR FAMILIES

Tornadoes are common in Wisconsin and worth taking seriously. The most violent tornadoes are capable of tremendous destruction with wind speeds of 250 miles per hour or more. Damage paths can be in excess of a mile wide and 50 miles long. When a tornado is coming, you have only a short amount of time to make life-or-death decisions. Advance planning and quick response are the keys to surviving a tornado.

A tornado is defined as a violently rotating column of air extending from a thunderstorm to the ground. It usually forms when weather is warm, humid and unsettled, and often in conjunction with severe thunderstorms. Direction of movement usually is from the southwest to the northeast, but a tornado's path may be erratic. Likewise, tornadoes tend to occur between 3 and 8 p.m., but they may occur any time.

BE PREPARED

- *Conduct tornado drills each tornado season.* Designate an area in your home as a shelter and practice having everyone in the family go there in response to a tornado threat. A basement, storm cellar or lowest level of your home is best. If there is no basement, use an inner hallway or a small inner room without a window, such as a bathroom or a closet.

- *If you live in a mobile home, plan to take shelter in another building with a strong foundation.* Some mobile home parks provide shelter for residents. If your park does not have a community shelter, consult with the management and request that one be provided.

- *Know the difference between a "tornado watch" and a "tornado warning."*

  a) A tornado watch is issued by the National Weather Service when weather conditions are such that tornadoes are likely to develop. When a watch is announced, you should listen to the radio or television for further developments; keep a battery-powered radio on hand in case electrical power is lost; and tie down loose objects outside or bring them inside.
  b) A tornado warning is issued when a tornado has been sighted or indicated by radar. At this point, the danger is very serious and everyone should go to a safe place, turn on a battery-operated radio or television and wait for the "all clear" by the authorities.

- *Have emergency supplies on hand.*

  a) Flashlights and extra batteries
  b) Portable battery-operated radio and extra batteries
  c) First-aid kit and manual; essential medicines
  d) Emergency food, water, cooking equipment, can opener
  e) Cash and credit cards
  f) Sturdy shoes

- *Develop an emergency communication plan.* In case family members are separated during a disaster because of work or school, choose a long-distance relative or friend to serve as the "family contact." After a disaster, it is often easier to call long-distance than to make a local call. Make sure everyone in the family knows the name, address and phone number of the contact person.

DURING A TORNADO

If you are at home during a tornado:

- *Go at once to the basement, storm cellar or the lowest level of the building.* If there is no basement, go to an inner hallway or a small inner room without a window, such as a bathroom or a closet.
- *Get away from windows.*
- *Go to the center of the room.* Stay away from corners because they tend to attract debris.
- *Get under a piece of sturdy furniture such as a workbench or heavy table.*
- *Use your arms to protect your head and neck.*

If at work or school:

- *Go to the basement or to an inside hallway at the lowest level.*
- *Avoid wide rooms such as auditoriums, cafeterias or large hallways.*
- *Get under a piece of sturdy furniture such as a workbench, heavy table or desk.*
- *Use your arms to protect your head and neck.*

If outdoors:

- *If possible, get inside a building.*
- *If shelter is not available or there is no time to get indoors, lie in a ditch or low-lying area or crouch near a strong building.*
- *Use your arms to protect your head and neck.*

If in a car or truck:

- *Never try to outdrive a tornado.* Tornadoes can change direction quickly and can lift up a car or truck and toss it through the air.
- *Get out of the car immediately and take shelter in a nearby building, ditch or low-lying area away from the vehicle.*

AFTER A TORNADO

♦ Gas leaks. If you smell the putrid odor of leaking gas, leave your home immediately and call the gas company. Lanterns, torches, electrical sparks and cigarettes could cause an explosive fire if there is a leak. Do not turn on any light switches.

♦ Electrocution. Check utility lines and appliances for damage. If electrical wiring appears damaged, turn off the current at the main fuse box or circuit breaker.

♦ Structural damage. Watch for falling debris and the possibility of collapse.

♦ Water. If water pipes are damaged, do not use water from the tap; it may be contaminated. Damaged sewage systems should be serviced as soon as possible – they are health hazards.

Additional resources:

Your local emergency government office, the American Red Cross, your county Extension office, the Wisconsin Division of Emergency Government, the Federal Emergency Management Agency

Related publications:

"Tornado Awareness," Wisconsin Division of Emergency Government, 1991.

Information from: University of Wisconsin Cooperative Extension, Federal Emergency Management Agency, Wisconsin Division of Emergency Government

Protecting Homes From Lightning

WHAT TO DO BEFORE LIGHTNING STRIKES

Three protective measures will help safeguard your home from lightning: a lightning-rod and ground system, a grounded TV antenna and grounded appliances. These devices are particularly important if you live in an area subject to frequent or severe thunderstorms. Unless you have the expertise, have only licensed electrical contractors install these systems.

LIGHTNING-ROD SYSTEMS

Lightning-rod and ground systems, if properly installed, are believed to be at least 90 percent effective in preventing damage should a lightning strike occur. They were more common years ago, when they were sold door to door with high pressure tactics. Today, fewer homes have such systems, perhaps because people feel the $1,500-plus cost outweighs the risk. Just what is the risk? One estimate says a Wisconsin home is likely to be struck by lightning once every 350 years.

A good lightning protection system has five components:

- The lightning rod or air terminal intended to intercept the strike. Some metal roofs can be used as air terminals.
- A cable capable of conducting the electrical charge safely to the ground.
- The ground connector, which provides contact with the earth so that the lightning can be safely dissipated.
- The bonding between the first three components so that no side flash occurs at the joints because of a poor connection.
- The lightning arrester or surge protector. Arresters guard against damage that may occur from lightning that strikes a nearby power line, phone line or other wire entering the house.

Quality components and proper installation are both important. If you are purchasing a system be sure it has been approved by the Lightning Protection Institute or Underwriters Laboratory. Also be sure that the contractor is listed or certified by one or both of these groups.

GROUNDED TV ANTENNAS

Even if you have a lightning rod system, outdoor television antennas should be grounded. The “core of protection” created by a grounded high point probably extends downward at a 45-degree angle all around the high point. A grounded antenna is no substitute for a lightning-rod system, however.

If you have a lightning-rod and ground system, the TV can be grounded by connecting the mast to the rod system. The ribbon lead-in should run through the arrester; the arrester should be grounded to one of the lightning-rod grounds. The arrester should be located at a lower level (closer to the earth) than the TV set.

GROUNDED APPLIANCES

Appliances are more frequently burned out by electrical surges from nearby lightning strikes than from direct lightning. Lightning does not have to strike the distribution line to cause such a surge. To protect appliances, have a “secondary lightning arrester” installed in the service wires at the point where they drop to the house. Your electric power supplier can tell you where to purchase these secondary arresters and what kinds would be best for your electrical system.

SURGE PROTECTORS

A relatively inexpensive way to protect electronic equipment from power surges is though use of surge protectors. These devices are typically attached between the appliance and the wall outlet. They protect delicate electronic components in appliances such as microwave ovens, computers and VCRs from power surges caused by lightning or other sources. You can purchase surge protectors at computer and office-equipment stores.

Additional resources:

Your county Extension office, your electric power supplier, licensed electrical contractors, the Lightning Protection Institute

Information from: University of Wisconsin Cooperative Extension, Pennsylvania State University Cooperative Extension Service
University of Wisconsin-Extension • Cooperative Extension

Standby Electric Generators

A SOURCE OF EMERGENCY POWER FOR FARMERS

An emergency source of power is important for any farm with mechanically ventilated production facilities, bulk milk handling equipment, mechanical feeding equipment or facilities requiring constant and continuous heat (such as brooders). On such a farm, a standby electric generator is a good investment, possibly preventing costly losses during a power failure.

During disasters such as flood or tornado, relief agencies may provide generators to farmers on an emergency basis.

TYPES OF GENERATORS

Standby generators are either engine driven or tractor driven. Either type can be stationary or portable. Engine driven units can be either manual or automatic start. Gasoline-, LP gas- (bottled gas) and diesel-fueled engines are available.

Generators must provide the same type of power at the same voltage and frequency as that supplied by power lines. This is usually 120/240 volt, single phase, 60 cycle alternating current (AC). An air-cooled engine is often used for generators up to 15 kilowatts. A liquid-cooled engine is necessary for generators larger than 15 kilowatts. Engine capacity of 2 to 2 1/4 hp with the proper drive system must be available for each 1,000 watts of generator output.

SIZE OF GENERATORS

A full-load system will handle the entire farmstead load. Automatic engine-powered, full-load systems will begin to furnish power immediately, or up to 30 seconds after power is off. Smaller and less expensive part-load systems may be enough to handle essential equipment during an emergency.

Power-take-off (PTO) generators are about half as costly as engine-operated units. Under a part-load system, only the most essential equipment is operated at one time. For most farms, this type of system is adequate, provided the generator is sized to start the largest motor. For example, the milk cooler or ventilation fan would need to be operated continuously, but the operation of the silo unloader and mechanical feeding system could be postponed until the milking chores are completed. PTO units can be mounted on a trailer.

INSTALLATION

Wiring and equipment must be installed in accordance with the National Electrical Code, local ordinances and the requirements of your power supplier. It is essential that you have the proper equipment for disconnecting the generator from public utility lines. Most companies require the installation of a double-pole double-throw transfer switch or its equivalent for this purpose. Check with your electrician or power supply representative for installation, installation instructions and inspection.

LOCATION AND SAFETY FEATURES

- Large engine generators should be located in a building, preferably a heated building.
- Inlet and outlet air ducts must be large enough to carry off excess heat. They should be open at least a half a square foot for each 1,000 watts of generator capacity.
- Combustion fumes must be carried outdoors safely. Exhaust pipes must be at least 6 inches from combustible material.

OPERATION

An automatic standby unit should start automatically when power fails, and stop when power is restored. When using an engine-driven generator with a manual start, or when using a tractor driven unit, follow this procedure when power fails:

- Call your power supplier and advise them of the conditions.
- Turn off or disconnect all electrical equipment.
- Position the tractor or engine for belt of PTO drive.
- Start the unit and bring the generator up to proper speed (1,800 or 3,600 rps). Check on arrangement to carry off exhaust fumes. Be sure there is no danger of fire. The voltmeter will indicate when the generator is ready to carry the load.
- Put the transfer switch in the generator position.
- Start the largest electrical motor first, adding other loads when each is up to operating speed. Do not add too much too fast. If the generator cuts out for any reason, repeat the second, third and fourth steps above.
- Check the voltmeter frequently. If voltage falls below 200 volts for 240 volt service or below 100 volts for 120 volt service, reduce the load on the generator by turning off some electrical equipment.
- When commercial power is restored, put the transfer switch in normal power position. Then stop the standby unit.

MAINTENANCE

- Keep the unit clean and in good running order at all times so it will be ready for immediate use. Dust and dirt accumulations on the motor can cause it to overheat when operated.
- Follow maintenance instructions in manufacturer's manual. A short operation at set intervals will keep the engine in good operating condition. Regularly scheduled warm-ups are necessary to keep a standby engine in working order.

Additional resources:

Your county agricultural agent

Related publications:

UW-Extension publications–

“Standby Electric Power Equipment for the Farm and Home,” (AF2273);

“Electrical Systems for Agricultural Buildings,” (checklist), (A8NE846);

“Electrical Systems for Agricultural Buildings,” (recommended practices), (A8NE845).

“Standby Power,” Illinois Farm Electrification Council, Fact Sheet #2.

Information from: University of Wisconsin Cooperative Extension, Pennsylvania State University Cooperative Extension Service
University of Wisconsin-Extension • Cooperative Extension

Salvaging Food After a Tornado

FOOD SAFETY IN THE EYE OF A DISASTER

Damaged food supplies, water contamination and temporary loss of refrigeration may be critical issues for you as a tornado survivor. While structural damage may be the initial focus in your home, some basic precautions can keep your food stores safe and your family healthy as you begin clean-up efforts.

If you live in an area susceptible to tornadoes, keep an adequate supply of food, bottled water and emergency equipment on hand. This includes enough canned food to last four to five days, a hand can opener, battery-powered radio, extra batteries and emergency cooking equipment like a camp stove with fuel to operate it.

Additional resources:

Your county family living agent, your local emergency government office, the American Red Cross, the Federal Emergency Management Agency

Related publications:

UW-Extension Publications–

"Management of Food for Emergencies," (B3045);

"Quick Consumer Guide to Safe Food Handling," (BG248);

"When the Home Freezer Stops," (B2837);

"Keeping Food Safely," (B3474).

USE CAUTION WITH WATER AND FOOD SUPPLIES

The water supply may be disrupted or contaminated after an area has sustained a tornado. Food in damaged buildings and homes may be hazardous. Follow these precautions:

- Drink only approved or chlorinated water.
- Consider all water from wells, cisterns and other delivery systems in the disaster area unsafe until tested.
- Check foods and discard any containing particles of glass or slivers of other debris.
- Discard canned foods with broken seams.

REFRIGERATION AND FREEZER CONCERNS

If the electricity is off to the refrigerator or freezer, follow these guidelines:

- Discard refrigerated meats, seafood, milk, soft cheese, eggs, prepared foods and cookie doughs if they have been kept above 40 degrees F. for over two hours. Also discard thawed items that have warmed above 40 degrees F., with the exception of breads and plain cakes.
- Discard any refrigerated items that turn moldy or have an unusual odor or appearance.
- Refreeze partially or completely frozen foods.
- Cold but fully thawed, uncooked meat, fish or poultry should be checked for off-odor. If there is none, cook and eat or cook and refreeze.
- Discard combination dishes such as stews, casseroles and meat pies if they are thawed.
- Refreeze thawed (but cold) juices, baked goods, and dairy items such as cream, cheese and butter.
- Do not refreeze thawed vegetables unless ice crystals remain. Cook and use them if there are no off-odors.

Information from: University of Wisconsin Cooperative Extension, Purdue University Cooperative Extension Service, "Food News For Consumers," Spring 1992.

Disinfecting Dishes, Cookware and Utensils

SAFETY GUIDELINES AFTER A DISASTER

During a disaster such as a flood, tornado or fire, kitchen items easily can become contaminated. Floodwaters may contain silt, raw sewage, oil or chemical wastes, while fires may leave residues from toxic fumes or fire-fighting chemicals. Before using any item that has come in contact with these substances, follow the guidelines at right.

DISASSEMBLE, WASH AND DISINFECT

Take apart any item that can be cleaned in pieces. If possible, remove handles from pots. If you have a dishwasher and the hot water temperature is at least 140 degrees F., use a long wash cycle and heated drying cycle to clean and disinfect dishwasher-safe items. Regarding other items, or all items if you don't have a dishwasher, follow these steps:

- Wash all items in a a strong detergent solution. Use a brush to remove dirt. Rinse in hot water.
- Immerse glass, porcelain, china, plastic dinnerware and enamelware for 10 minutes in a disinfecting solution of 2 tablespoons of chlorine bleach per gallon of hot water.
- Disinfect silverware, metal utensils, and pots and pans by boiling in water for 10 minutes. Chlorine bleach should not be used in this case because it reacts with many metals and causes them to darken.
- Air-dry dishes. Do not use a towel.
- Discard and replace soft, porous plastic or wood items saturated by floodwater, since they cannot be sanitized. These include baby bottles, nipples and pacifiers.
- If cupboards and counters come in contact with floodwater, clean and rinse them with a chlorine bleach solution before storing dishes.

Additional resources:

Your county family living agent, the American Red Cross, the Federal Emergency Management Agency

Related publications:

“Repairing Your Flooded Home,” American Red Cross/Federal Emergency Management Agency, 1992.

Information from: University of Wisconsin Cooperative Extension, Michigan State University Cooperative Extension Service, Illinois Cooperative Extension Service, University of Florida Cooperative Extension Service

Inspecting Farm Buildings for Wind Damage

SAFETY CHECKS AFTER A STORM

Wind damage to buildings is not always readily apparent. For this reason, examine all farm buildings for hidden damage after a severe windstorm or tornado. Undetected damage could weaken a structure, creating possible hazards. Prompt repair is usually less expensive in the long run.

ROOF

- *Damaged or missing shingles.* Check asphalt shingles for cracks at the butt end, where they may have been weakened from flexing. Make sure individual shingles have not blown off. Thoroughly inspect shingles on the ridge, gable ends and eaves.
- *Loose nails on metal roofing.* Inspect the entire roof, with particular attention to gable ends, eaves and ridge cap. If nails have worked loose, re-nail them as soon as possible. If the nails don't hold when hammered back in, use #12 or #14 metal screws to fill old nail holes. (Use aluminum screws on aluminum and steel screws on steel.) In addition to screws, re-nail 3 to 4 inches away with ring or screw-type nails.
- *Potential leaks.* On a sunny day, check the roof carefully from inside with the building doors closed. While looking for holes in the roof, inspect the ridge, gable ends and eaves for possible structural separation.

FOUNDATION

Inspect the foundation. The plate should not be separated from the studding where the foundation meets the walls. On block foundations, inspect mortar joints to make sure the block with the plate bolt in it hasn't separated from the wall. On stone or concrete foundations, check to see that the plate bolts have not worked loose.

SILO

Make sure the silo is still plumb. Look for loose hoops. Inspect the roof to be sure it remains fastened to the silo. Inspect the base of metal silos inside and outside for hairline cracks. If there is rust around the base, remove it with a wire brush. Then check for cracks and apply a rust preventive paint. Look for new cracks in the plaster of empty concrete stave silos.

INTERIOR

Inspect the interior of buildings for structural damage. Using a good light, check the framing. Look for ridge separation, loose knee braces and loose rafters where the rafters join the walls.

Additional resources:

Your county agricultural agent

Information from: University of Wisconsin Cooperative Extension, Pennsylvania State University Cooperative Extension Service

Assessing Roof Damage After a Tornado

REPAIR STRATEGIES FOR HOMEOWNERS

If your roof has suffered structural damage from a tornado, make family safety your first priority. In some cases, such as a partially collapsed roof, you may need to relocate until repairs are made. Next, report damage to your insurance company. If you must make temporary repairs before an insurance adjuster's visit, take photographs or make a videotape of damage. You will need good records for insurance claims, applications for disaster assistance and income tax deductions.

WORKING WITH YOUR INSURANCE COMPANY

Call your insurance agent about the damage to your home and roof so that your agent can file a claim. The sooner you talk to your agent, the sooner your claim will be filed and an adjuster will inspect your damage. The amount of coverage for your loss depends on your policy. But even if you don't have full coverage, your agent may be able to give you advice on where to get help with repairs.

Because some damage may not be discovered until repairs are underway, don't be in a hurry to settle your insurance claim. Instead, keep your insurance agent apprised of repair estimates and repairs; have your building contractor or roofer discuss repairs and estimates with your agent if possible. Only settle your claim when you feel all repairs are known and/or made. That way, if related problems such as water damage, foundation damage or the need for new wiring are uncovered during reconstruction, your insurance settlement may reflect these as well. (See the fact sheet “Insurance Coverage and Making a Claim.”)

TEMPORARY REPAIRS

If temporary repairs are needed before the professionals arrive, be sure that only a physically able person is allowed on the roof. Unsteadiness on the ladder or roof can lead to severe injuries. If the roof is sagging from structural damage, wait for a professional to assess damage and make repairs; a sagging roof may unexpectedly collapse.
Cover holes in the roof, walls or windows with boards, tarps or plastic sheeting. If possible, place tarps or plastic over the ridge so rain rolls off. Nail down plastic sheets or trash bags with strips of wood and secure them with duct tape. If the holes are large, you may need to support the plastic in the center to keep it from ripping from the weight of the rain.

If sections of the roof or floors are sagging, have a contractor or other knowledgeable person brace weak areas. Improper bracing may increase damage and the chance of injury, so do not attempt this work unless you are experienced in structural repairs.

PERMANENT REPAIRS

If damage is limited to non-structural elements such as shingles, flashing and sheathing, contact a professional roofer for the work. If damage is structural in nature, hire a general contractor. (See the fact sheet, “Hiring

a Contractor After a Disaster.") A general contractor can replace the entire roof structure or portions of the roof as necessary, in addition to handling related repairs. If the contractor does not have roofing expertise (e.g. shingles, sheathing, etc.), he may subcontract this portion of the work to a specialist.

Additional resources:

Your family living agent, your local emergency government office, the American Red Cross, the Federal Emergency Management Agency

Information from: University of Wisconsin Cooperative Extension
University of Wisconsin-Extension • Cooperative Extension

winter storms

Winter Storm Preparedness and Response

SAFETY AT HOME AND WHILE TRAVELING

Winter storms are worth serious consideration in Wisconsin. Blizzards, heavy snow, freezing rain and sub-zero temperatures hit hard and frequently across the state. Even if you think you are safe and warm at home, a winter storm can become dangerous if the power is cut off. With a little planning, you can protect yourself and your family from the many hazards of winter weather, both at home and on the road.

BE AWARE OF THE FORECAST

- *Winter weather advisory.* Formerly called a “travelers' advisory,” this alert may be issued by the National Weather Service for a variety of severe conditions. Weather advisories may be announced for snow, blowing and drifting snow, freezing drizzle, freezing rain (when less than ice storm conditions are expected), or a combination of weather events.
- *Winter storm watch.* Severe winter weather conditions may affect your area (freezing rain, sleet or heavy snow may occur either separately or in combination).
- *Winter storm warning.* Severe winter weather conditions are imminent.
- *Freezing rain or freezing drizzle.* Rain or drizzle is likely to freeze upon impact, resulting in a coating of ice glaze on roads and all other exposed objects.
- *Sleet.* Small particles of ice, usually mixed with rain. If enough sleet accumulates on the ground, it makes travel hazardous.
- *Blizzard warning.* Sustained wind speeds of at least 35 miles per hour are accompanied by considerable falling and/or blowing snow. This is the most perilous winter storm, with visibility dangerously restricted.
- *Wind chill.* A strong wind combined with a temperature slightly below freezing can have the same chilling effect as a temperature nearly 50 degrees lower in a calm atmosphere. The combined cooling power of the wind and temperature on exposed flesh is called the wind-chill factor.

BE PREPARED AT HOME

- *Keep a battery-powered radio and flashlights in working order; stock extra batteries.*
- *Store food that can be prepared without an electric or gas stove.*
- *Stock emergency water and cooking supplies.*
- *Have candles and matches available in case of a power outage.*
- *Have sufficient heating fuel; regular fuel sources may be cut off.*
- *Have some kind of emergency heating equipment and fuel (a kerosene heater, a gas fireplace or wood-burning stove or fireplace) so you can keep at least one room of your house warm if power is cut off.* (See the fact sheet “Staying Warm in an Unheated House.”)

IF STRANDED ON THE ROAD

If your vehicle becomes stalled or stopped in a winter storm, follow these tips until help arrives.

♦ Keep calm and stay in your vehicle. Do not attempt to walk out of a blizzard. You are much more likely to be found by staying in your vehicle.

♦ Keep fresh air in your vehicle — especially if you are using a candle, solid fuel or other type of heating device — to prevent carbon monoxide build-up and oxygen starvation.

♦ Run motor and heater sparingly and only with the down-wind window open for ventilation. Make sure snow has not blocked the exhaust pipe.

♦ Turn on dome light at night. This helps make the vehicle visible for work crews.

♦ Keep watch. Do not permit all occupants to sleep at once.

♦ Exercise. Clapping hands and moving arms and legs vigorously will help keep you awake and improve circulation.

Additional resources:

The National Weather Service and local radio stations, your county family living agent, the Wisconsin Division of Emergency Government, the Federal Emergency Management Agency

Related publications:

"Winter Travel Awareness,"

BE PREPARED IN YOUR CAR

Keep your car "winterized" with antifreeze. Carry a winter car kit that includes a windshield scraper, flashlight, candle and matches, tow chain or rope, shovel, tire chains, blanket, extra mittens, bag of sand or salt, a fluorescent distress flag and an emergency flare.

RIDING OUT A STORM AT HOME

If you are isolated at home, listen to the radio or television for updates on weather conditions. Conserve fuel by keeping your house cooler than usual and by temporarily "closing off" heat to some rooms. When emergency heating methods must be used, maintain adequate ventilation to avoid build-up of toxic fumes. (See the fact sheet, "Staying Warm in an Unheated House.")

Dress accordingly. Layer your clothing; many layers of thin clothing are warmer than single layers of thick clothing. If you need to go outdoors or the heat is off indoors, wear mittens; they are warmer than gloves. Wear a hat; most body heat is lost through the top of the head. Cover your mouth with scarves to protect your lungs from directly inhaling extremely cold air.

If shoveling snow isn't critical, don't do it. If you must shovel snow, take your time and lift small amounts. Over-exertion can bring on a heart attack — a major cause of death during and after winter storms.

IF TRAVELING IN BAD WEATHER

- *Use public transportation, if possible.* Try not to travel alone during a storm.
- *Make sure your vehicle is in good operating condition, winterized, properly serviced and equipped with snow or all weather tires.* Be sure your headlights, taillights and windows are clean so you can see and be seen.
- *Listen to your radio for weather information.*
- *Always fill your gas tank before entering open country, even for short distances.* You are less likely to get stranded with a full tank. If you do get stranded, you will have enough gas to run the motor and heat the vehicle.
- *Let someone know your departure time, expected arrival time and route.*
- *Seek shelter immediately if the storm seems severe.* Don't be foolhardy.
- *Drive carefully and defensively.* Don't try to save time by traveling faster than road and weather conditions permit.
- *Never carry spare fuel inside the vehicle or the trunk.* Gasoline fumes can build up and cause a violent explosion.

Information from: University of Wisconsin Cooperative Extension, Federal Emergency Management Agency, Wisconsin Division of Emergency Government

Protecting Plumbing During a Winter Storm

CARE OF UTILITIES AND APPLIANCES WHEN THE POWER IS OUT

If the heat will be off in your home for several days during a winter storm, you should protect exposed plumbing, sewage systems and appliances from freezing and subsequent damage. Frozen pipes could become a problem once the temperature inside the home falls below 40 degrees F.

If some pipes have frozen, despite the fact that power has returned or exists, there are some simple measures to take. But whenever possible, get an expert for plumbing work or repairs.

REDUCE THE CHANCE OF FROZEN PIPES

Follow these steps to reduce the chance of pipes freezing during a power failure:

- Shut off the water at the main valve, or turn off the well pump if it is in the house.
- Turn the water heater off. An explosion could result if the heater is left on without water in the system. You will find either an electrical switch or gas valve for shutting off the appliance.
- Open all the faucets on the lower level, then the upper level. You may want to collect the water for household use.
- Insulate undrainable pipes around their main valves. Use newspaper, blankets or housing insulation.

Unlike summer homes and cottages, modern housing is not usually designed for easy winterization. For this reason, you should contact a plumber or other expert if the house will be without heat for an extended period of time. Critical measures include: draining of toilets, water softening units, drain traps, sump pumps, heaters, humidifiers, dishwashers and other appliances that use water.

WHEN PIPES FREEZE

Under normal circumstances, most of us never have to worry about a frozen water pipe. Our plumbing pipes are on interior walls and are insulated well enough that water does not freeze. But frozen pipes may become a concern if the heat is off or if water pipes run through unheated crawl spaces, floors over garages or in outside walls.
If pipes do freeze:

- Shut off the water supply and open faucets to the frozen pipes;
- Warm them with a heat lamp, blow dryer or portable heater;
- Do not use boiling water, propane torches or any open flame to thaw frozen pipes;
- Apply only moderate heat and expect to wait for several hours;
- Open sink cabinets to let in warm air.

If pipes have burst before you could take preventive action, immediately turn off their water supply. Try to locate the areas that need repair and call a plumber.

LONG-TERM SOLUTIONS

The long-term solution for frozen pipes is to provide adequate insulation and heat. Methods may include wrapping pipes with insulation material and installing weather stripping, insulation and heat to the room. A temporary or last resort solution is the use of electric heating tape, which can be wrapped around the pipes and energized when sub-zero weather is predicted. You can also leave faucets connected to exposed pipes trickling when low temperatures are forecasted. If the pipes are under an enclosed sink, open the door and use a fan to blow warm air from the room toward the pipes.

Additional resources:

Your county family living agent

Information from: University of Wisconsin Cooperative Extension, Pennsylvania State University Cooperative Extension Service, North Carolina Cooperative Extension Service

Ice Dam Prevention on Roofs

SIMPLE WAYS TO ALLEVIATE THE PROBLEM

Ice dams occur when a snow-covered roof over the attic is warmer than the eaves — the overhang of a roof. If the roof is warm, it will cause the snow to melt and run under snow along the roof. When the melted snow hits the cooler eaves, it freezes. As ice builds up on eaves, it eventually traps water behind it. The water backs up under shingles and finds its way through seams in the building paper and roof decking to enter the attic and living area. Wallpaper, plaster and paint surfaces may be damaged in the process. Fortunately, there are several ways to remedy the problem.

WHEN SEEPAGE HAS ALREADY BEGUN

If you have an immediate problem with ice dams, you should remove the snow from the part of the roof directly above the ice dam. This limits the amount of water that can collect behind the dam.

- *Remove the snow using a roof rake, hoe or push broom.* Roof rakes have long handles that allow you to stay on the ground when clearing a single-story roof. You can purchase them at hardware stores.

- *Avoid using sharp instruments, such as axes, to break channels through the ice.* This is likely to cause roof and structure damage.

PREVENTION

A cooler attic area will help decrease problems with ice dams. Here are two ways to keep attics cool:

- *Increase insulation in the attic to at least 12 inches.* Also, close any thermal shortcuts —openings that allow air to move from the heated part of the house into the attic. Chases around chimneys, plumbing vents, junction boxes for ceiling light fixtures, attic hatches and ceiling fan mounts are common thermal shortcuts.

- *Create adequate attic ventilation to remove any heat that escapes into the attic.* One square foot of free ventilation opening is recommended for every 150 square feet of attic space. Ventilation should be divided between eaves and the house ridge to take advantage of the fact that warm air rises. When installing eave or soffit vents, be sure that the opening is not blocked by insulation. You can do that by installing a cardboard or plastic channel over the insulation lined up with each vent.

Additional resources:

Your county Extension office

Information from: University of Wisconsin Cooperative Extension, Pennsylvania State University Cooperative Extension Service

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Additional resources:

Your county Extension office

Information from: University of Wisconsin Cooperative Extension, Pennsylvania State University Cooperative Extension Service

Staying Warm in an Unheated House

COPING WITH A POWER OUTAGE IN WINTER

During severe winter storms, your home heating system could be inoperative for as long as several days. To minimize discomfort and possible health problems during this time, conserve body heat by dressing warmly; find or improvise an alternative heat source, such as a fireplace or electric space heater; confine heating to a single room; and keep safety a foremost consideration. While chances of freezing to death in your home are small, there's a greater danger of death by fire, lack of oxygen or carbon monoxide poisoning.

THINK "SAFETY FIRST"

Safety is of extreme importance in a heating emergency. Follow these precautions:

- Do not burn anything larger than candles inside your home without providing adequate ventilation to the outside.
- Any type of heater (except electric) should be vented. Connect the stove pipe to a chimney flue if at all possible. (Many older homes have capped pipe thimbles in rooms once heated by stoves.) Or hook up your stove to the flue entrance of the non-functioning furnace pipe. If no other alternative exists, consider extending a stove pipe through a window. Replace the window glass with a metal sheet and run the temporary stove pipe through the metal.
- If you use a catalytic or unvented heater, cross-ventilate by opening a window an inch on each side of the room. It is better to let in some cold air than to run the risk of carbon monoxide poisoning.
- Do not use a gas or electric oven or surface units for heating. A gas oven may go out or burn inefficiently, leading to carbon monoxide poisoning. An electric oven was not designed for space heating.
- Do not burn outdoor barbecue materials such as charcoal briquettes inside — even in a fireplace.
- Do not try to use bottled gas in natural gas appliances unless you have converted the appliances for such use. Also, flues and piping suitable for gas burning appliances may be unsafe for use with higher-temperature oil, coal or wood smoke.
- Have one person watch for fire whenever alternative heat sources are used. One person should also stay awake to watch for fire and to make sure ventilation is adequate. If the designated person feels drowsy or has a headache, it may be a sign of inadequate ventilation.
- Keep firefighting materials on hand. These may include: dry powder fire extinguishers, a tarp or heavy blanket, sand, salt, baking soda and water.

CONSERVE BODY HEAT

Put on extra clothing. If cold is severe, your bed may be the warmest place. Use extra blankets and coverings to trap body heat; this is an especially good way to keep children warm. Farm families might consider taking refuge in the relative warmth of the livestock barn.

FIND OR IMPROVISE AN ALTERNATIVE HEAT SOURCE

You may have alternative heating resources around your home. Possibilities include:

- fireplace, space heater, catalytic camp stove
- wood, gas or oil heater
- gas-fired hot water heater

PROVIDE FUEL

Some common materials that could be used for fuel include:

- firewood, newspapers, magazines
- camp stove fuel, kerosene
- wood chips, straw, corncobs

You can burn coal in a fireplace or stove if you make a grate to hold it, allowing air to circulate underneath. “Hardware cloth” screening placed on a standard wood grate will keep coal from falling through.
Tightly rolled newspapers or magazines can be used as paper “logs.” Stack them as you would stack firewood to allow for air circulation.

If the heating situation becomes critical, consider burning wood, including lumber or furniture.

SELECT A ROOM TO BE HEATED

To increase efficiency of available heat, close off all rooms except the one to be heated. When selecting a room, consider the following:

- If using a vented stove or space heater, select a room with a stove or chimney flue.
- Confine emergency heat to a small area.
- Try to select a room on the “warm” side of the house, away from prevailing winds. Avoid rooms with large windows or uninsulated walls. Interior bathrooms probably have the lowest air leakage and heat loss. Your basement may be a warm place in cold weather because the earth acts as insulation and minimizes heat loss.
- Isolate the room from the rest of the house by keeping doors closed, hanging bedding or heavy drapes over entryways, or by erecting temporary partitions of cardboard or plywood.
- Hang drapes, bedding or shower curtains over doors and windows,

Additional resources:

Your county family living agent, your local power company

Information from: University of Wisconsin Cooperative Extension, Pennsylvania State University Cooperative Extension Service

Winter Power Failure on the Farm

KEEPING ANIMALS AND EQUIPMENT SAFE

A winter power failure or fuel shortage can cause problems on farms, but being prepared can keep problems to a minimum. Ideally you should have a standby electric generator for emergency power. For ideas on types of generators and their operation, see the fact sheet "Using Standby Electric Generators." Assuming you have no power, take the following precautions to keep animals and equipment safe.

POULTRY AND LIVESTOCK

To protect poultry and livestock during a power failure:

- *Ventilate buildings.* Do not close buildings tight to conserve heat, since animals could suffocate from lack of oxygen. Clear ice and snow from all vents because oxygen will eventually be used up in mechanically ventilated production facilities. Then open vents to facilitate natural air flow.

- *Provide water.* All animals, especially cattle, need plenty of water during cold weather. It may be possible to drive your water pump with a small gasoline engine and a belt. Otherwise, you will need to haul water.

If you have an outside source of water, cattle can be turned out to drink it. Be sure to place sand or other gritty material on icy feedlots to provide good footing. Whatever the source of water, watch that it remains unfrozen so animals can drink it.

- *Provide heat.* Use camp stoves and heaters as emergency heat sources for brooders. Plan ahead to have this equipment ready when needed.

- *Provide feed.* Animals need extra energy for body heat during severe or prolonged cold weather, especially if they are outside without shelter. Mechanical feeders will be inoperable during a power failure. Provide for emergency feeding procedures.

EQUIPMENT

Unplug or turn off all electric equipment to prevent damage when power is restored.

If you use portable space heaters for supplemental heat, close off the fuel valve as soon as possible after power is interrupted. (On models not equipped with safety shut-offs, and especially on some models with gravity feed fuel systems, fuel continues to flow even when the burner is inoperative. An explosion or fire could result when power is restored.)

STORING MILK

- Request that the dairy pick up milk as soon as possible.

- Consider adding a standby power generator to handle vital electric equipment.

Even if you are short of extra milk storage facilities, do not store milk in stock tanks or other containers. Dairy plants may not accept milk that has been stored in anything other than regular milk storage containers. Check with your local dairy about policy regarding emergency storage of milk.

If you are unable to cool your milk or have it picked up, check your tank for souring each time you add milk to it. This check could mean the difference between losing all or only part of your milk supply.

Additional resources:

Your county agricultural agent

Information from: University of Wisconsin Cooperative Extension, Pennsylvania State University Cooperative Extension Service

Animal Safety in Winter

PROVIDING ADEQUATE SHELTER, FEED AND WATER

For animals normally kept outside during the winter, safety can be a concern during extended periods of severe cold, snow or wet conditions. Wind coupled with severe or prolonged cold weather causes additional stress on livestock, increasing their needs for shelter, food and water.

PROVIDE SHELTER

Severe cold alone usually will not affect the performance of large animals on full feed. Wind, however, can be a serious stress factor. A strong wind has about the same effect on animals as exposure to a sudden drop in temperature. In general, a 20 mph wind is about equivalent to a 30 degree F. drop in temperature. Under extreme conditions, simple wind and snow protection devices will not be 100 percent effective.

Move stock, especially the young, into sheltered areas during severe periods of cold. Adequate shelter is important because animals' extremities are subject to freezing during sub-zero weather. Extremities that become wet or are normally wet are particularly subject to frostbite and freezing. The loss of ears or tails could be of little economic significance, but damage to male reproductive organs could impair the animals' fertility or ability to breed. Frozen and chapped teats will impact milk production.

- Shallow open-front sheds provide excellent shelters for livestock. Such shelters should have slots along the eaves on the back side. The openings provide ventilation and prevent snow from swirling into the front of the shed. Use a 1-inch slot per 10 feet of building width. Continuous ridge openings of 2 inches also are recommended for each 10 feet of building width.

- Solid-sided feed wagons work well for temporary wind protection. Attach plywood or locate bales of straw or feed at the bottom of the wagon to block wind from moving under the wagon.

- Windbreaks, properly oriented and laid out, or timber-covered lowlands make good protection for range cattle. Unlike shed-type shelters, windbreaks eliminate concerns about overcrowding or proper ventilation.

- Never close shelters tightly, since stock could suffocate from lack of oxygen.

- Additional bedding is helpful to keep animals insulated from the ground and to keep them dry during cold periods.

PROVIDE EXTRA FEED

During severe or prolonged cold weather, animals need extra feed to provide body heat and to maintain production weight gains. Provide them

with additional, higher fiber feeds such as hay or hay mixed with oat straw. A good formula during cold weather is to increase feed 1 percent for every degree drop in temperature below 32 degrees F. For example, when the temperature drops from 32 degrees F. to 0 degrees, provide 32 percent more feed (break this into three or four feedings a day). Usually, animals instinctively eat more feed if a storm is approaching.

Remember that mechanized feeders may be inoperable during power failures. Unless you have a source of emergency power, you may need extra labor to feed, water and care for animals by hand.

PROVIDE WATER

Dehydration is often a greater hazard during winter storms than cold or suffocation. Cattle cannot lick enough snow to satisfy their water requirements. They also will need more water if they are eating a higher-fiber diet. Use heaters in water tanks to provide livestock with enough water. Or, only pump out as much water as needed twice a day, to avoid problems with freezing water. If pipes freeze or power is out, you may need to haul water to animals.

WATCH YOUR LIVESTOCK

Watch your livestock carefully during winter storms and periods of severe cold. Keep them moving. If you see them shivering, not moving or acting abnormally, call your veterinarian. In particular, watch younger cattle for signs of trouble.

Additional resources:

Your county agricultural agent, the National Weather Service for livestock safety warnings

Information from: University of Wisconsin Cooperative Extension, Pennsylvania State University Cooperative Extension Service

Standby Electric Generators

A SOURCE OF EMERGENCY POWER FOR FARMERS

An emergency source of power is important for any farm with mechanically ventilated production facilities, bulk milk handling equipment, mechanical feeding equipment or facilities requiring constant and continuous heat (such as brooders). On such a farm, a standby electric generator is a good investment, possibly preventing costly losses during a power failure.

During disasters such as flood or tornado, relief agencies may provide generators to farmers on an emergency basis.

TYPES OF GENERATORS

Standby generators are either engine driven or tractor driven. Either type can be stationary or portable. Engine driven units can be either manual or automatic start. Gasoline-, LP gas- (bottled gas) and diesel-fueled engines are available.

Generators must provide the same type of power at the same voltage and frequency as that supplied by power lines. This is usually 120/240 volt, single phase, 60 cycle alternating current (AC). An air-cooled engine is often used for generators up to 15 kilowatts. A liquid-cooled engine is necessary for generators larger than 15 kilowatts. Engine capacity of 2 to 2 1/4 hp with the proper drive system must be available for each 1,000 watts of generator output.

SIZE OF GENERATORS

A full-load system will handle the entire farmstead load. Automatic engine-powered, full-load systems will begin to furnish power immediately, or up to 30 seconds after power is off. Smaller and less expensive part-load systems may be enough to handle essential equipment during an emergency.

Power-take-off (PTO) generators are about half as costly as engine-operated units. Under a part-load system, only the most essential equipment is operated at one time. For most farms, this type of system is adequate, provided the generator is sized to start the largest motor. For example, the milk cooler or ventilation fan would need to be operated continuously, but the operation of the silo unloader and mechanical feeding system could be postponed until the milking chores are completed. PTO units can be mounted on a trailer.

INSTALLATION

Wiring and equipment must be installed in accordance with the National Electrical Code, local ordinances and the requirements of your power supplier. It is essential that you have the proper equipment for disconnecting the generator from public utility lines. Most companies require the installation of a double-pole double-throw transfer switch or its equivalent for this purpose. Check with your electrician or power supply representative for installation, installation instructions and inspection.

LOCATION AND SAFETY FEATURES

- Large engine generators should be located in a building, preferably a heated building.
- Inlet and outlet air ducts must be large enough to carry off excess heat. They should be open at least a half a square foot for each 1,000 watts of generator capacity.
- Combustion fumes must be carried outdoors safely. Exhaust pipes must be at least 6 inches from combustible material.

OPERATION

An automatic standby unit should start automatically when power fails, and stop when power is restored. When using an engine-driven generator with a manual start, or when using a tractor driven unit, follow this procedure when power fails:

- Call your power supplier and advise them of the conditions.
- Turn off or disconnect all electrical equipment.
- Position the tractor or engine for belt of PTO drive.
- Start the unit and bring the generator up to proper speed (1,800 or 3,600 rps). Check on arrangement to carry off exhaust fumes. Be sure there is no danger of fire. The voltmeter will indicate when the generator is ready to carry the load.
- Put the transfer switch in the generator position.
- Start the largest electrical motor first, adding other loads when each is up to operating speed. Do not add too much too fast. If the generator cuts out for any reason, repeat the second, third and fourth steps above.
- Check the voltmeter frequently. If voltage falls below 200 volts for 240 volt service or below 100 volts for 120 volt service, reduce the load on the generator by turning off some electrical equipment.
- When commercial power is restored, put the transfer switch in normal power position. Then stop the standby unit.

MAINTENANCE

- Keep the unit clean and in good running order at all times so it will be ready for immediate use. Dust and dirt accumulations on the motor can cause it to overheat when operated.
- Follow maintenance instructions in manufacturer's manual. A short operation at set intervals will keep the engine in good operating condition. Regularly scheduled warm-ups are necessary to keep a standby engine in working order.

Additional resources:

Your county agricultural agent

Related publications:

UW-Extension publications–

“Standby Electric Power Equipment for the Farm and Home,” (AF2273);

“Electrical Systems for Agricultural Buildings,” (checklist), (A8NE846);

“Electrical Systems for Agricultural Buildings,” (recommended practices), (A8NE845).

“Standby Power,” Illinois Farm Electrification Council, Fact Sheet #2.

Information from: University of Wisconsin Cooperative Extension, Pennsylvania State University Cooperative Extension Service
University of Wisconsin-Extension • Cooperative Extension

Winter Kill of Alfalfa

PROMOTING WINTER HARDINESS AND MANAGING DAMAGE

Winter kill of alfalfa cannot be avoided entirely in a bad year, but you can minimize its destruction with good manage-ment practices. Frequency of cutting, date of last cutting, and fertilizing are all factors you can control before the first freeze. Once damage is done, careful assessment of your stands can increase your success with reseeding.

Contributors to winter kill include low temperatures, ice cover and repeated freezing and thawing. When repeated freezing and thawing cause ice heave, the crown of the plant is forced out of the soil and alfalfa roots may break.

Disease also is a contributor to winter kill. The weather conditions described above can lead to disease; but conversely, stands that already are diseased are more susceptible to winter kill. Typical diseases include bacterial wilt, fusarium wilt, phytophthora and root rot.

PREVENTION OF WINTER KILL

Factors affecting winter kill include:

- *Age of the stand.* The younger the stand, the greater its winter hardiness.
- *Alfalfa variety.* Varieties can make a difference; choose proven winter hardy varieties. For up-to-date information, see the annual Cooperative Extension publication, "Forage Variety Update for Wisconsin."
- *Soil fertility.* High soil fertility can minimize the chances of winter kill. Use a soil test to be sure potassium levels are in the optimum range. A fall application of fertilizer can be helpful. Adjust fertilizers for the amount of annual growth.
- *Cutting frequency for the previous season.* The more frequently stands are cut, the more susceptible they are to winter kill. Try to let the alfalfa mature to 10 percent bloom at one harvest to rebuild the stand condition.
- *Date of last fall cutting.* A late fall cutting is not recommended, particularly if you cut frequently during the season. If possible, take your last cutting before Sept. 1. If you must cut late in the season, try to cut high (leaving 6 to 8 inches of stubble). This leaves a layer of insulation for the crown. The higher stems also can reduce suffocation when ice cover is a problem.
- *The amount of growth prior to killing frost.* The greater the growth, the better the chance of survival.

ASSESSING STANDS IN SPRING

After frost is out, inspect alfalfa plants for root and crown condition. If plant roots are not fleshy or off-white, plants are dead or dying. If plants have considerable crown or root rot, they are likely to die. However, keep in mind that after the first year of growth, all plants will show some signs of crown rot; therefore, look for degree of severity.

Compare stands to the following chart:

STAND DENSITY REQUIRED FOR MAXIMUM YIELD

First year after seeding	20-25 per square foot
Second year after seeding	12-15 per square foot
Third year after seeding	6-8 per square foot

If plant counts are significantly less than those in the chart, expect reduced yields and increased weed problems. You may need to plow damaged areas down and reseed. But keep in mind your first assessment is preliminary; it is only intended to eliminate the worst stands. The final assessment cannot be made until after plants begin to green up. Some stands are weakened and show injury in spring. Others look healthy at first, but die later in the spring.

CONSIDERATIONS FOR RESEEDING

Your reseeding options vary depending upon age of stands and when winter kill occurred. If winter kill occurred in early winter, you have more options for reseeding because there will be less autotoxicity in plants. Autotoxicity is caused by an accumulation of one or more compounds that inhibit germination and growth of new alfalfa seedlings. It is found in old stands of alfalfa. Since it takes time for the autotoxic factor to degrade, stands killed in early winter may have less autotoxicity than those killed in spring.

- *If stands were seeded last year*, disk to destroy remaining plants in affected areas of the field and reseed alfalfa at a rate of 12 pounds per acre. Use a variety with a high level of resistance (HR) to phytophthora root rot and one that has been treated with the fungicide Apron. It may be possible to reseed only affected areas of the field.

- *If stands were seeded two years ago,* autotoxicity may be a problem. If kill occurred in early winter, reseed as directed above. If kill occurred toward spring or date of kill is unknown, disk areas to be reseeded and wait two to three weeks before reseeding. Use an Apron-treated alfalfa variety with a high level of resistance (HR) to phytophthora root rot.

- *If stands were seeded three years ago or more,* reseeding success is likely to be reduced by autotoxicity. If stand kill occurred early in winter, till areas to be reseeded and wait two to three weeks before seeding. Use an Apron-treated alfalfa variety with a high level of resistance (HR) to phytophthora root rot. The best option is to interseed with red clover at 8 pounds per acre or with an annual or perennial ryegrass at a seeding rate of 8 to 15 pounds per acre, depending on density of remaining alfalfa stand. If winter kill occurred in spring, consider seeding another crop, such as a grain or annual forage like sorghum-sudan grass. Then reseed alfalfa in August or next year.

Additional resources:

Your county agricultural agent

Related publications:

UW-Extension publications–

“Alfalfa Management Guide,” (A3550);

“Forage Variety Update for Wisconsin,” (A1525).

Information from: University of Wisconsin Cooperative Extension
University of Wisconsin-Extension • Cooperative Extension

Winter Kill of Small Grains

PROMOTING WINTER HARDINESS AND MANAGING DAMAGE

Unstable winter temperatures and lack of snow cover take most of the blame for winter kill of small grains. But other variables play a part as well. Two major factors are planting dates and the grain varieties used. Generally, early planting yields more winter hardiness, better stands and higher yields. Grain varieties with excellent winter hardiness can make a big difference for growers as well.

Despite your best efforts, however, winter kill may cause serious damage. If stands are thin, you have several options, ranging from fertilizing to replanting to applying for disaster payments.

PLANTING GUIDELINES FOR THE FALL

- Test soil to determine fertility of field.
- Control perennial weeds, such as quackgrass.
- Use good tillage practices.
- Fertilize to a yield goal of 100 to 150 bushels per acre.

    a) Use nitrogen at 25 lb. per acre.
    b) Use phosphorous and potassium at high levels prior to planting.

- Select a variety with the highest yield for your area, as well as good winter hardiness. Consult with your county Extension office for current data as necessary. Public winter wheat varieties Glacier and Merrimac, for example, are rated “excellent” for winter hardiness in Wisconsin; Cardinal, Caldwell and Howell are rated “good.”
- Plant at the optimum date for your area, considering location and likelihood of aphid infestation. For high winter hardy varieties like Glacier and Merrimac, for example, planting dates are:

    a) Sept. 15-Oct. 10 in southern Wisconsin.
    b) Sept. 10-Oct. 5 in central Wisconsin.
    c) Sept.1-20 in northern Wisconsin.

Planting dates for varieties with medium winter hardiness, such as Cardinal, Caldwell and Howell, are:

    a) Sept. 1-15 in southern Wisconsin.
    b) Aug. 25-Sept. 15 in central Wisconsin.
    c) Aug. 20-Sept. 10 in northern Wisconsin.

Plant in 4- to 7-inch row spacings, incorporating tramlines for subsequent management practices.

- Plant 30 to 40 seeds per square foot.

ASSESSING THE STAND IN SPRING

- Check stand density in the spring as soon as winter survival can be rated.

    a) If stand is adequate (more than 18 plants per foot of row), apply 25 lb. of nitrogen per acre just prior to or at tillering time (Growth Stage 20).

b) If stand is poor (fewer than 18 plants per foot of row), apply up to 50 lb. of nitrogen to promote tillering.

- Use proper weed control measures if weeds are anticipated to be a problem.
- Apply an additional 50 to 75 pounds of nitrogen at stem elongation (Growth Stage 30) for grain filling.
- Apply fungicides as needed for disease control during the growing season.
- Harvest on time at optimum grain moisture.
- Provide for adequate, safe storage space.

COMMON QUESTIONS

- *When isn't a crop worth saving?* If you see fewer than six plants per square foot, consider ripping them up and replanting something else, such as spring wheat, barley or oats.
- *Should you interseed spring wheat if the stand is poor?* Generally, the disadvantages of interseeding outweigh the advantages. For one thing, differences in maturation rates mean harvest loss and and a lesser quality of wheat. Secondly, hard-red spring wheats and soft-red winter wheats are used in different ways, making them difficult to sell as a mixed-class wheat. If you plan to use the crop for feed, however, this is not a serious concern.
- *Should you claim a loss through the Agricultural Stabilization and Conservation Service (ASCS)?* If you are enrolled in the wheat program and you had major damage from winter kill, this may be the best solution. Consult with your county agricultural agent and ASCS personnel if you need help making this decision. If the claim is approved you may be able to collect a disaster payment, replant spring small grains or corn and still protect your wheat base.
- *What weather conditions will increase the chances of winter kill?*

  a) A rapid drop in temperature in the fall instead of a gradual drop. This will increase chances of winter kill because plants don't have time to develop winter hardiness.
  b) Lack of snow cover and repeated warming and freezing. These conditions occur frequently in the months of February and March. In some cases, plants will break dormancy and start growing before winter conditions have ended. In other cases, plants may be smothered by ice sheets, ponding and flooding that develop.

Additional resources:

Your county agricultural agent

Related publications:

UW-Extension publication “Small Grain Varieties for Grain and Forage in Wisconsin,” (A3397).

Information from: University of Wisconsin Cooperative Extension
University of Wisconsin-Extension • Cooperative Extension

Fire Prevention and Safety on the Farm

SOUND MANAGEMENT PRACTICES FOR PRODUCERS

Fire prevention is critical on any farm, but sometimes overlooked until it is too late. The heat and smoke of fire, along with the toxic gases and rapid loss of oxygen, can kill quickly. Without prevention and safe management practices, you put your own life at risk, as well as that of family members, employees and animals. On top of that, your farm buildings, equipment and means of earning an income can be wiped out in minutes. Safe management practices can make the difference.

For starters, you should:

♦ Avoid "building in" fire hazards in the initial construc-tion of your farm buildings and management practices. For example, use all noncombustible or flame-retardent materials possible. Also, keep motors and machine tools free of dust and grease.

♦ Fight fire before it starts by keeping all ignition sources away from combustible material in and around your farm buildings.

♦ Get proper fire insurance coverage for your livestock, buildings and equipment.

MAKE TIME FOR INSPECTIONS AND FIRE DRILLS

- *Invite your local fire department to your farm.* Let them get acquainted with your facilities and help identify any fire hazards. Ask for their input in making your operation more fire-safe and fire-proof.
- *Develop and carry out a fire safety inspection for animal buildings and other buildings.* Follow a routine preventive maintenance schedule and checklist for fire hazards.
- *Conduct regular fire drills, so all family members and employees know what they should do.* After a drill, hold a meeting to discuss improvements in procedures and equipment. Educate yourself and others about fire safety practices.
- *Update and upgrade your farm buildings in accordance with the latest National Electrical Code.* Use all noncombustible materials. Install a lightning protection system and inspect it periodically.

KEEP THINGS CLEAN AND IN GOOD REPAIR

- *Make good housekeeping part of your daily routine.* Cut down and remove weeds and brush from around buildings. Keep work areas clean, dry and unobstructed. Never block exits or aisles, even for a few minutes. If you have a poultry building, check for excessive accumulations of dust, down feathers or cobwebs on sides, roof or rafters. Find a place for everything and keep it there.
- *Test your fire or smoke alarm system at least once a year.* Likewise, flush outside private fire hydrants at least once a year. Check fire doors and shutters on a regular basis to make sure they are free of any obstructions and in good operating condition. Check all water control valves and air and water pressures of automatic sprinkler systems every week.
- *Make sure that power needs for ventilation, feed distribution and other functions are met without overloading your electrical system.* Follow the National Electrical Code. Use good material and proper fuse size or circuit breaker rating. Use junction boxes at all splice points. Use waterproof wiring and receptacles, enclosed electric motors and similar equipment in any buildings which are cleaned periodically with high-pressure equipment.

more information ▸

FIRE EXTINGUISHER TIP

Remember the phrase P-A-S-S if you attempt to put out a small fire with an extinguisher. P is for pull the pin of the extinguisher (or with some units, Press the puncture lever or release the lock hatch); A is for aim low or point the unit's nozzle at the base of the fire; S is for squeeze the handle to release the extinguishing agent; and the other S is for sweep from side to side. Keep the extinguisher aimed at the base of the fire and sweep back and forth until it appears to be out. Never turn your back on a small fire, even if it looks as if it is out. Be prepared in case it flashes again.

- *Inspect all wiring and electric motors and appliances* for exposed wires, broken insulation, improper grounding and improper installation. Equip motors with thermal overload relays or cutouts.

- *Check the heating system* to make certain that every furnace or stove is in good repair. See that ducts and air shafts are clean of dust and debris, motors are cleaned and oiled (if necessary) each season, and pulley belts are in good working order. Check gas and fuel oil systems for leaks and unsafe installations. Keep all types of heating devices and other equipment clean and in good condition.

MINIMIZE HAZARDS ON SITE

- *Strictly enforce a "no smoking" rule* inside any buildings or areas where flammable and combustible materials are stored. Never smoke near storage, shipping or receiving areas where boxes or other containers can easily start a fire.

- *Be extremely careful when handling gasoline.* It is flammable and explosive. If your clothing becomes contaminated with a flammable material, change immediately. Never refuel gasoline engines while they are running or hot.

- *Keep flammable liquids in labeled safety containers and store them in approved flammable-liquid safety cabinets.*

- *Keep above-ground fuel storage tanks at least 40 feet from buildings.* This setback minimizes the potential for fire spread and generally is required for compliance with Wisconsin's Flammable and Combustible Liquids Code, ILHR 10. For more information, contact your regional storage tank inspector at the Department of Industry, Labor and Human Relations.

KNOW YOUR FIRE EXTINGUISHERS

- *Select and provide proper fire extinguishers.* Always make sure the unit on the wall matches the type of fires that could develop in that area. There are different types of extinguishers for different kinds of fires. If you use the wrong unit on a fast-moving fire, you can cause the fire to spread even faster.

- *Read the extinguisher's instructions to learn how to use the extinguisher before a fire ever starts.* Make sure all extinguishers are serviced, maintained and tagged at intervals, not to exceed one year.

- *Know your limits and always think safety first.* Fire extinguishers cannot do the job of a local fire department. When a fire burns for more than a couple of minutes, the heat starts to build up and intensify. Once that happens, you are past a point of first aid. Get out of the building and let firefighters handle the situation.

Additional resources:

Your local fire department, the National Fire Protection Association, your county agricultural agent

Related publications:

"Fire Control in Livestock Buildings," (NRAES-39), a publication of the Northeast Regional Agricultural Engineering Service.

The National Fire Protection Association Catalog, available by calling (800) 344-3555.

Information from: University of Wisconsin Cooperative Extension, University of California at Modesto Cooperative Extension Service, the National Fire Protection Association

Farmstead Evacuation During a Fire

SETTING PRIORITIES IN AN EMERGENCY

Fires are dangerous anywhere, but on the farm they pose unique perils for animals and their owners. Toxic fumes can kill or cause permanent lung damage. Panicked animals behave unpredictably or refuse to respond to normal handling approaches. They may trap themselves and their rescuers in a rapidly spreading fire.

Work with your local fire department to minimize fire risk on your farm. Formulate an emergency fire plan and practice it regularly with family members and employees. Likewise, conduct periodic fire safety inspections. (See the fact sheet "Fire Prevention and Safety on the Farm.") Above all, remember that your first priority should always be human safety—and that includes you.

PRIORITIES

People have been seriously injured or killed when trying to save animals, grain or equipment on their farms. They forget that smoke and toxic fumes can kill them in seconds.

- *Human safety, including your own life, must be your first priority.* Make sure you, your family members and employees are safe. Call the fire department immediately and let the experts take control. If you can use a fire extinguisher on a small fire, do so. But realize its limitations in the face of a fast-moving blaze.

- *Your property, as a business investment, comes second.* When your farmstead is burning, it's time to make your hardest business decisions. Firefighting crews may ask you which building to save first, second, third, etc. Ask yourself if it is more important to save livestock, machinery or feed. If a livestock building is on fire, animals may already have been exposed to deadly heat, smoke and gases. It may be safer and more realistic to save an adjacent building or vehicles stored inside it.

CALLING THE FIRE DEPARTMENT

- *When calling the fire department, be prepared to give accurate and complete information, including:*

  a) The exact location of your farm.
  b) The extent and location of the fire.
  c) The color of smoke coming from the burning structure(s). For example: "A lot of black smoke is coming from the back of the vehicle storage building." This helps firefighters know what materials are burning and what materials they need to fight the fire.
  d) Anything else the dispatcher requests. Stay on the line until the dispatcher is through collecting all the necessary information.

- *Make sure the fire department has complete access to the blaze.* Do not let vehicles, livestock or people block the driveway or access to buildings. This is a typical problem for firefighters. It can only lead to greater damage and danger for all concerned.

- *Alert firefighters to potential hazards, including pesticide and chemical storage areas and fuel tanks.*

AFFECTED LIVESTOCK

If animals have suffered from heat, smoke inhalation or burns, get a veterinarian to examine and treat them immediately. If possible, spray water on animals to cool them.

Some animals may need to be destroyed. According to meat safety laws in Wisconsin, animals that have died from fire (or any means other than slaughter) are automatically condemned and cannot be sold for food. Injured animals need state certification from a veterinarian before they can be sold for slaughter. For more information, call the Meat Inspection and Safety Bureau at the Wisconsin Department of Agriculture, Trade and Consumer Protection at (608) 266-2227.

LIVESTOCK BUILDINGS

Livestock evacuation is very risky business. If fire or smoke is significant within an animal building, the danger is generally too great to risk your own life. Some considerations include:

- *Smoke, fire, burning insulation and toxic fumes.* Some types of insulation consume oxygen, give off poisonous smoke or "rain fire" — that is, they may melt and drip as they burn. Fiberglass doesn't burn. Be aware of the type of insulation in your barns and anticipate how it might react in a blaze. Remember that smoke inhalation and heat already may have harmed your animals to the extent they need to be destroyed. Don't be the next victim.

- *Animals may refuse to leave the building.* Cows and horses tend to panic if they are frightened or forced to use a secondary exit. In some cases, evacuated animals run back into burning buildings. Some farmers have had luck leading a few panicked animals out by throwing a gunnysack over their heads.

- *Don't become trapped.* If you are able to evacuate animals, be sure you are not leading them toward a dead-end, such as a gate that won't open outward.

- *Containment may be the best answer.* Oxygen fuels a fire. Sometimes it is best to close the doors and wait for the fire department. Poultry buildings, especially, are prone to flash fires because of their construction and the large amounts of dust inside. If you open the door, a burning poultry building is likely to burst into flames.

- *Smoldering hay.* If hay is slowly smoldering in an upper level of a barn or silo, call the fire department and, if possible, begin evacuation. This is one instance where you may have enough time for a quiet, orderly evacuation. DO NOT try to throw smoldering hay out a window or door; exposure to oxygen fuels a blaze.

Additional resources:

Your local fire department, your county agricultural agent, the National Fire Protection Association

Related publications:

"Fire Control in Livestock Buildings," (NRAES 39), the Northeast Regional

Information from: University of Wisconsin Cooperative Extension; the City of Fitchburg Fire Department, Dane County, Wisconsin

Clean-up After a Fire on the Farm

SAFETY CONCERNS AND WHERE TO GO FOR HELP

Hazards may still exist after firefighters leave the scene of a farm fire. Contaminated water runoff and hazardous debris are two of the most common challenges for farmers during clean-up efforts. With a little foresight, you can avoid injury to yourself, your family and your livestock. You also can streamline clean-up and rebuilding.

GENERAL GUIDELINES

- *Contaminated water runoff.* When water used in firefighting mixes with pesticides, fuels or other hazardous materials, the result is a harmful runoff. It poses an immediate threat to groundwater (including your wells), surface water, humans, animals and the environment. By law, appropriate steps must be taken for containment and clean-up.

  a) *Notify authorities.* If hazardous materials have been released in the course of firefighting, local and state authorities must be notified and consulted for legal clean-up methods. Immediately contact your Local Emergency Planning Committee (LEPC), as well as the Wisconsin Division of Emergency Government Spill Hotline at (800) 943-0003.
  b) *Containment.* In some cases, the fire department may help build dikes or ditches to help contain water runoff until local emergency response teams (hazardous materials specialists) arrive. In other cases, emergency response teams will be called in to contain and clean up the spill. If a spill is very small, officials may request that you clean up the spill and dispose of waste at the next Agricultural Clean Sweep event. In either case, try to direct hazardous runoff away from porous (sand or gravel) soils to avoid groundwater contamination.
  c) *Take safety precautions.* Wear protective gear if you must enter a contaminated area, such as a flooded pesticide storage room. Keep livestock away from contaminated waters. Place warning signs on contaminated areas and/or fence them off so that livestock, children or others aren't accidentally exposed.

- *Building debris.* Before beginning clean-up, take photographs or make a videotape of damage. This will be helpful for insurance records and/or income tax loss deductions. Also, have an insurance adjuster inspect the premises. Based on insurance reimbursement and advice from a building inspector or contractor, make decisions about whether to rebuild or restore existing facilities (See the fact sheet, “Salvaging Buildings After a Fire.”) Some clean-up suggestions:

  a) *Turn off the power to damaged buildings.* Normally, power is shut off during firefighting. Nevertheless, be absolutely sure you are not dealing with live wires.
  b) *Wear protective gear and use caution.* Falling debris, exposed nails, glass, contaminants and sharp edges all pose hazards during clean-up. Wear steel-toed boots, a hard hat, gloves and other protective gear when necessary.

c) *Ask about local and state requirements for refuse disposal, including any special requirements for livestock killed by fire.*
d) *Hire a professional contractor for demolition.* A professional is your best bet for safe, efficient clean-up.

- *Farm equipment and vehicles.* Contact your insurance agent to ascertain coverage and decide whether restoration is feasible. Even if vehicles were not burned, heat can damage rubber, plastic, glass and paint. If farm vehicles and field equipment have sustained only minor to moderate smoke damage, specialty cleaning companies can provide steam cleaning. Smoke cannot get into sealed engines, so reconditioning usually is not a concern. For milking equipment, contact the manufacturer about clean-up and testing services.

Additional resources:

Your county agricultural agent, your insurance agent

Information from: University of Wisconsin Cooperative Extension
University of Wisconsin-Extension • Cooperative Extension

Salvaging Food After a Fire

WHAT'S SAFE WHEN THE WORST IS OVER

Use extreme caution when trying to save food after a fire. Food and utensils damaged by heat, smoke, chemicals or water may not be safe to use. Food in cans or jars may appear to be okay. But if it has been close to the heat of the fire, it may no longer be edible. Heat from the fire can activate food spoilage bacteria or cause undesirable flavor changes.

Toxic fumes can contaminate food items as well. Items stored in permeable packaging should be thrown away. If you detect an off-flavor or smell in refrigerated foods, dispose of them as well. Your family's health is not worth the risk.

WHEN IN DOUBT, THROW IT OUT

Be thorough in inspecting kitchen items for water, smoke, chemical and heat damage. When in doubt, throw it out.

- Throw out any of these items if they have come in contact with waters or chemicals used in fire fighting:

  a) Fresh produce, meat, poultry, fish and eggs.
  b) Opened containers and packages.
  c) Containers with peel-off tops, or cork-lined, waxed cardboard or paraffin (waxed) seals.
  d) All food in cardboard boxes, paper, foil, plastic, cellophane or cloth.
  e) Spices, seasonings and extracts, flour, sugar and other staples in canisters.

- Throw away any items that were charred or near the fire. Heat damage may not be apparent on the outside of canned goods, but extreme heat can harm the contents. Throw them away.

- Throw away any raw foods stored outside the refrigerator like potatoes or fruit, which could be contaminated by fumes or chemicals.

- Disinfect cans that have no heat damage and are free from dents and rust. Mark contents with an indelible pen, them remove the label. Clean with detergent and scrub brush. Immerse for 10 minutes in a warm solution of chlorine bleach and water — 2 tablespoons of bleach per gallon of water.

REFRIGERATION AND FREEZER CONCERNS

Refrigerator and freezer seals may not be air-tight. If food has an off-smell or flavor when it is prepared, throw it out.

If the electricity is out to the refrigerator or freezer, follow these guidelines:

- Discard refrigerated meats, seafood, milk, soft cheese, eggs, prepared foods and cookie doughs if they have been kept above 40 degrees F. for over two hours. Also discard thawed items that have warmed above 40 degrees F., with the exception of breads and plain cakes.

- Discard any refrigerated items that turn moldy or have an unusual odor or appearance.

- Refreeze partially or completely frozen foods.
- Cold but fully thawed, uncooked meat, fish or poultry should be checked for off-odor. If there is none, cook and eat or cook and refreeze.
- Discard combination dishes such as stews, casseroles and meat pies if they are thawed.
- Refreeze thawed (but cold) juices, baked goods, and dairy items such as cream, cheese and butter.
- Do not refreeze thawed vegetables unless ice crystals remain. Cook and use them if there are no off-odors.

Additional resources:

Your county family living agent, the American Red Cross, the Federal Emergency Management Agency

Related publications:

UW-Extension Publications–

"When the Home Freezer Stops," (B2837);

"Quick Consumer Guide to Safe Food Handling," (BG248);

"Keeping Food Safe," (B3474).

Information from: University of Wisconsin Cooperative Extension, Purdue University Cooperative Extension Service, Michigan State University Cooperative Extension Service, "Food News for Consumers," Spring 1992.

Disinfecting Dishes, Cookware and Utensils

SAFETY GUIDELINES AFTER A DISASTER

During a disaster such as a flood, tornado or fire, kitchen items easily can become contaminated. Floodwaters may contain silt, raw sewage, oil or chemical wastes, while fires may leave residues from toxic fumes or fire-fighting chemicals. Before using any item that has come in contact with these substances, follow the guidelines at right.

DISASSEMBLE, WASH AND DISINFECT

Take apart any item that can be cleaned in pieces. If possible, remove handles from pots. If you have a dishwasher and the hot water temperature is at least 140 degrees F., use a long wash cycle and heated drying cycle to clean and disinfect dishwasher-safe items. Regarding other items, or all items if you don't have a dishwasher, follow these steps:

- Wash all items in a a strong detergent solution. Use a brush to remove dirt. Rinse in hot water.
- Immerse glass, porcelain, china, plastic dinnerware and enamelware for 10 minutes in a disinfecting solution of 2 tablespoons of chlorine bleach per gallon of hot water.
- Disinfect silverware, metal utensils, and pots and pans by boiling in water for 10 minutes. Chlorine bleach should not be used in this case because it reacts with many metals and causes them to darken.
- Air-dry dishes. Do not use a towel.
- Discard and replace soft, porous plastic or wood items saturated by floodwater, since they cannot be sanitized. These include baby bottles, nipples and pacifiers.
- If cupboards and counters come in contact with floodwater, clean and rinse them with a chlorine bleach solution before storing dishes. Likewise, clean and disinfect surfaces affected by smoke, toxic fumes or firefighting chemicals.

Additional resources:

Your county family living agent, the American Red Cross, the Federal Emergency Management Agency

Related publications:

“Repairing Your Flooded Home,” American Red Cross/Federal Emergency Management Agency, 1992.

Information from: University of Wisconsin Cooperative Extension, Michigan State University Cooperative Extension Service, Illinois Cooperative Extension Service, University of Florida Cooperative Extension Service

Salvaging Feed After a Fire

OPTIONS AFTER SMOKE, WATER OR FIRE DAMAGE

The best rule for fire-damaged feed may be, "Assume the worst until proven otherwise." Damage to feed may come from heat, water, chemicals, smoke or the fire itself. In some cases, you may have a total loss; in other cases, you may be able to salvage all or part of your feed. But for the safety of your animals, either dispose of or test any suspicious feed. If you feed contaminated, moldy or otherwise damaged feed, you risk lowered production, illness or death in your animals. At the least, animals may refuse to eat feed that has been charred or has an odor.

SILAGE

- *Damaged silage* must be unloaded because:

  a) Overheated silage has lost its nutritional value.
  b) The top layers of wet silage may spoil or be unacceptable to animals.
  c) Any missed hot spots may reignite.

- *Heat damage and fire damage.* Silage that has been heated above 150 degrees F. loses much of its nutritional value. Charred silage also will have little feed value; cows may not eat it, depending on taste or aroma. In some instances, cows actually eat more heat-damaged silage to try to compensate for the lost nutritional value. To determine quality of overheated silage, send it to a feed testing laboratory. Silage below the fire level will not be damaged and will not lose any nutritional value.

- *Water damage.* Silage saturated with water may mold and spoil because much of the preserving acid produced during fermentation has leached out or been diluted. The nutritional value of the saturated silage is reduced and the cows may refuse to eat it. Consider spreading it on land as a fertilizer.

GRAIN AND HAY

- *Debris.* Be aware that metal, lead paint, nails from the roof or other debris may have fallen into the feed during firefighting. Disposing of grain may be your best option if debris has compromised the feed.

- *Darkened or burned feed.* These have been oxidized and, therefore, nutritional value has been reduced. Animals most likely won't eat these feeds. Dispose of them or spread them on fields as fertilizer.

- *Wet feeds.* It may be difficult or impossible to dry wet grain or hay naturally. If these feeds are readily available and clean (no chance of chemical contamination or fire-fighting debris), feed them to livestock. Recognize that wet feeds may have only a few days of "shelf life" before spoilage occurs. Otherwise, spread them on fields as fertilizer or dispose of them.

- *Baled hay.* Small quantities may be dried naturally if broken apart. Larger quantities are generally a loss because of the difficulty of drying. Hay quickly spoils when wet—and moldy hay may be dangerously toxic to animals. If possible, spread hay on fields as a fertilizer or dispose of it.

Additional resources:

Your county agricultural agent, your veterinarian, forage testing laboratories

Related publications:

"Extinguishing Silo Fires," (NRAES-18), Northeast Regional Agricultural Engineering Service.

Information from: University of Wisconsin Cooperative Extension, Northeast Regional Agricultural Engineering Service

Salvaging Farm Buildings After a Fire

ASSESSING DAMAGE AND OPTIONS FOR REBUILDING

Before trying to salvage a structure after a fire, assess the true worth of what remains after fire, heat, smoke and water damage. The true worth will be higher if the structure can be effectively used as part of a reconstructed facility.

An engineer or experienced contractor can help you assess true worth. These experts can also help you consider options for reconstruction or new construction. Insurance coverage and other assets will probably be the final factor in your decision-making.

INSPECT EXISTING MATERIALS

- *Fiberglass and blown-in insulation.* If insulation has gotten wet, it will have to be removed and replaced with dry materials. If wall surfaces must be replaced in the process, consider upgrading wiring and plumbing at this time.
- *Steel.* When exposed to intense heat, steel loses its strength and any surface-applied corrosion protection. Steel beams cannot be relied upon to support loads for which they were originally designed. Replace these members if exposed to extreme heat to assure structural integrity of the building.
- *Metal roofing and siding.* Both rely on protective layers of galvanizing and/or paint to protect corrosion. Plan to replace these materials if exposed to heat, even if they were not in direct contact with flames.
- *Wood.* Light charring of wood will not significantly affect its strength. Replace wooden supports which have been deeply burned.
- *Metal truss plates.* Many roof trusses are fabricated with metal truss plates. The metal truss plates may lose more strength in a fire than the adjoining wood supports. Use a reliable contractor or engineer to determine the extent of damage at these critical joints.
- *Concrete and mortar.* These materials will flake off and/or turn to powder when exposed to heat. The thickness of the damaged concrete will be determined by the intensity and duration of heat exposure. Tap concrete with a hammer to test its integrity. A dull thud implies heat damage. A ringing sound means the concrete may be in reasonable condition.

SALVAGING EXISTING STRUCTURES

Once the value of the remaining structure is established, assess how the remnants can be rebuilt to meet your current and future needs. This is a good opportunity to consider updating or upgrading of facilities. For example:

- *Livestock buildings.* Consider livestock resting, water and feeding space needs; update ventilation, preferably using natural ventilation; install moisture-proof wiring and an equipotential plane to protect against stray voltage; install freeze-protected water systems; consider animal traffic and manure handling.

- *Milking facilities.* Consider a milking parlor or flat barn milking system; upgrade wiring and equipotential plane; improve lighting and ventilation; upgrade milking equipment and energy-conserving devices, such as air injectors, bulk tank heat exchangers and well-water precoolers.

- *Silos.* Consider horizontal feed storage for its improved rate of filling and emptying and lower cost of construction and operation; size new silos according to daily feeding needs.

- *Storage sheds.* Consider access doors; consider a shop; use proper wiring design and installation; consider size of items to be stored; consider separate pesticide storage.

BUILDING NEW STRUCTURES

If the remnants cannot be economically reworked to satisfy your needs, consider building a totally new structure. Be especially critical of the remnants when making this assessment. Consider:

- *Location.* Locate animal structures so odors blow away from the house and neighbors' houses; locate to take advantage of wind for natural ventilation in livestock buildings; consider space needs for future structures.

- *Drainage.* Locate on high ground to shed water from the site and to avoid flooding from upland areas.

- *Traffic patterns.* Consider how equipment, animals, feed, grain and manure will be routed around the farm.

- *Current size of structure and future expansion needs.* Develop a farmstead drawing of how your farmstead will look in 10 to 20 years.

- *Expense.* Before deciding on a final option, consider the economics of several options. Make your decisions based on lower annual cost options — not the lowest initial investment; consider your long-term needs when making a short-term decision.

FIRE CONTROL MEASURES

Be sure all new construction features fire-retardant material and design concepts that result in fire safety. Early warning devices such as smoke detectors and heat detectors should be part of new designs, as well as ventilation systems that shut down during a fire.

Additional resources:

Your county agricultural agent, Midwest Plan Service

Related publications:

UW-Extension publications–

“Contracting for Agricultural Construction,” (A3490);

“Farmstead Planning—Zoning and Regulations Checklist,” (A2725).

Northeast Regional Agricultural Engineering Service publication,“Fire Control in Livestock Buildings.”

Information from: University of Wisconsin Cooperative Extension
University of Wisconsin-Extension • Cooperative Extension

community/family issues

Insurance Coverage and Making a Claim

WHAT TO DO BEFORE AND AFTER A DISASTER

With the exception of flooding damage, most losses due to natural disasters are covered by homeowner's insurance. Still, few policies cover the cost of all damages. Study your policy and talk with your agent about additional coverage before disaster strikes. Find out whether claims are paid on the basis of replacement cost or current market value, and whether reimbursement covers total replacement cost or a given percentage of the replacement cost.

Contact your insurance agent immediately after a disaster. Planning ahead and having the agent's phone number and your policy number will expedite the process. It also helps to have a written and photo or video inventory of personal property. Finally, check with your local emergency government office about disaster rehabilitation assistance. Some disaster assistance may be available for expenses not covered by your insurance policy. (See the fact sheet, "Disaster Rehabilitation Assistance.")

TYPES OF INSURANCE

Many types of insurance may come into play during disaster recovery. If injuries or loss of life occurred, these will extend to health insurance, disability and life insurance. Clean-up and repair of your home and other property involve the following insurance types:

- *Homeowner's and renter's insurance.* In general, property insurance will include some coverage for "fire or lightning damage," and/or "wind and hail damage," which includes some of the typical damage from tornadoes and hurricanes.

  Most policies cover damage from water or water blowing in only if an opening to the structure sustains damage. Some may cover basement flooding caused by sewer backup or sump pump failure. Damage from surface water — as in floor or "rising water" damage — is not covered in the usual private policy. You must purchase special flood insurance for this coverage (see next bulleted item).

  A homeowner's policy will include several other elements as well, such as liability insurance for injuries or damages caused by you, a member of your family or a pet.

- *Flood Insurance.* Unless you specifically purchase flood insurance, your homeowner's policy does not insure you against losses caused by flooding. Most communities in Wisconsin participate in the National Flood Insurance Program (NFIP), under which you can buy federally-subsidized flood insurance at a reasonable cost. If your community participates, any owner or occupant of insurable property may buy a policy from a licensed insurance agent or broker, or directly from the NFIP. Buildings and their contents can be insured against flood loss; all direct losses by flood are covered.

  Your insurance agent, zoning administrator or other local official can tell you if your community participates in the NFIP. For routine policy rating or customer service inquiries, call the Federal Emergency Management Agency, which administers the program, at (800) 638-6620.

- *Automobile insurance.* Study your policy to determine the extent of your current coverage. Comprehensive insurance covers damage to your car from various natural disasters. Coverage includes flood, fire, smoke, wind, hail, glass breakage, vandalism, theft and collision with animals. Auto liability insurance is protection against the cost of defending yourself if you are sued for injury or damage caused by your car.

MAKING AN INSURANCE CLAIM

- *Contact your insurance agent and report the damage.* Give your name, address, policy number, and the date and time of loss. The sooner you talk to an agent, the sooner your claim will be filed and an adjuster will look at your damage. Ask when the adjuster will visit.

- *Protect your property from further damage or theft.* Patch roofs temporarily. Cover broken windows with boards or plastic. If household furnishings are exposed to the weather, move them to a safe location for storage. Take pictures of the damage beforehand if possible.

- *Keep accurate records:*

  a) A list of all cleaning and repair bills, including materials, cost of rental equipment and depreciation of purchase equipment.
  b) A list of all disaster-related living expenses, including motel and restaurant bills, home rental and car rental.
  c) A list of all actual losses, including furniture, appliances, clothing, paintings, artifacts, food and equipment, regardless of your intent to replace the objects. Try to document the value of each object lost. Written and videotaped household inventories, bills of sale, canceled checks, charge account records and insurance evaluations are good evidence. If you do not have such records, estimate the value and give purchase place and date of purchase.
  d) Photographs of damaged property. Pictures also can be used as evidence for tax deductions.

- *Contact a reputable and well-established firm or individual to have your damage repaired.* Sometimes undependable workers enter a damaged area, make cheap repairs and leave before residents discover that repairs are inadequate. Get recommendations and written contracts for the work.

- *Don't be in a hurry to settle your claim.* Often, people are so anxious to have their home restored after a disaster, they sign off on a settlement before damages are fully discovered or repair costs fully understood. (See sidebar at left.)

SETTLING YOUR CLAIM

Do not settle your claim until:

♦ A thorough inspection of the property has been completed by an insurance adjuster and repair contractor.

♦ Estimates for all damages have been prepared and you fully understand them. You, your insurance adjuster and contractor should agree on needed repairs and estimates.

♦ Advance insurance payments have been calculated, deductibles have been applied and you know the total amount of your settlement.

♦ You have identified damaged items you are keeping and agree with salvage deductions.

♦ You have identified any items that won't be repaired, but for which you will be paid an "appearance loss" (for example, hail-damaged siding).

♦ You and your contractor understand any time limits for repairs, as required by the insurance company. (Extensions usually can be granted with advance notice.)

Additional resources:

Your county family living agent, your insurance agent, the State Floodplain Management Program of the Wisconsin Department of Natural Resources, the Federal Emergency Management Agency

Information from: University of Wisconsin Cooperative Extension, Wisconsin Division of Emergency Government, Wisconsin Office of the Insurance Commissioner, North Carolina Cooperative Extension Service

Disaster Rehabilitation Assistance

GRANTS, LOANS AND HOW TO APPLY

A variety of disaster assistance is available to homeowners, farmers and businesses with property damage. Lending agencies make loans for home repair, improvement, land equipment and livestock. Federal and state assistance may be available if your community is declared a disaster area by your governor, a federal agency director or the president. Local government and media will keep you informed about disaster declarations and where to get information about any programs.

If your area is declared a major disaster area, one or more Disaster Application Centers (DACs) may open to provide information and take applications for assistance. They usually are located in a school or other public building.

While low-interest loans and cost-share programs can be very attractive, be sure you carefully analyze the impact of additional borrowing on your household, farm or business before you undertake any new obligations.

HOME AND PERSONAL PROPERTY

- During times of disaster, the Small Business Administration (SBA) offers medium- and long-term loans for rehabilitation of homes and personal property. Interest rates are relatively low. Two loan types:

  a) *Small Business Administration (SBA) Personal Property Loans:* For the repair and replacement of personal items such as clothing, furniture and automobiles.
  b) *SBA Real Property Loans:* To repair or restore a primary home to its pre-disaster condition. If you are required by local government to make structural improvements or relocate, these costs may be included in a loan.

- *Federal Emergency Management Agency assistance.* If you are denied an SBA loan, you may be eligible for a FEMA grant, which is administered by the state. Your community may also apply for funding under the Hazard Mitigation Grant Program, which covers acquisition and relocation expenses for homeowners in flood-prone areas, as well as flood-proofing. See your local or state emergency government office about participation and any restrictions.

- *Private lenders.* You may be eligible for loans from your local bank or credit union.

- *Historical societies.* Check with your local historical society about loan or grant programs available for architecturally significant properties.

BUSINESS

- *Small Business Association (SBA) Physical Disaster Business Loans:* To repair and/or flood-proof buildings and remove debris for small businesses.

- *SBA Economic Disaster Business Loans:* To permit small businesses to meet the financial obligations they would have made, had the disaster not occurred.

- *HUD Community Development Block Grants:* May cover relocation or flood-proofing of business properties as part of a larger community development plan. Grants are funded through the federal Housing and Urban Development agency.

OTHER ASSISTANCE

Insurance, volunteer organizations and businesses are three other important sources of assistance for disaster survivors. If you are fully insured, you may only have to pay the deductible and your insurance policy will pay for professional cleaning and reconstruction. The same is true for flood Insurance, which may be purchased in most Wisconsin communities through the National Flood Insurance Program. Meet with local emergency government officials about current options and funding sources related to flood-proofing or relocation.

Private volunteer organizations, such as the American Red Cross, the Salvation Army and church groups, usually are on the scene during or after a disaster. These groups help with clothing, groceries, shelter, medical aid, counseling and, in some cases, clean-up and rebuilding supplies. Services often are supplied free of charge.

Your local TV, radio and newspapers usually publicize ways that businesses are contributing to the recovery process. Some businesses may offer reduced prices, but you should be wary of "flood sales" of flood-damaged items.

Additional resources

Your county emergency government office, the Wisconsin Division of Emergency Government, the Federal Emergency Management Agency, the American Red Cross, your county family living agent

FARM

- *Agricultural Stabilization and Conservation Service (ASCS) Federal Farm Disaster Assistance:* To help with crop loss, feed assistance, farmland rehabilitation and lack of feed. Prior approval is required and specifications are subject to change.
- *Farmer's Home Administration Emergency Loan Program:* For damaged property, production costs associated with disaster, family living expenses, etc. Successful applicants must be credit worthy, but may already have been turned down by another lender.
- *Farm Bureau and other farm organizations:* Check with disaster relief officials or your local county Extension office.
- *Merchants and dealers:* May, if requested, extend credit for feed, equipment and rehabilitation of buildings and land.

INFRASTRUCTURE ASSISTANCE

FEMA Public Assistance Program. Financial assistance may be available to communities for disaster-related expenses, such as debris clearance, restoration and repair of buildings, roads, water facilities and utilities owned by state and local governments. Assistance also may be available to private, nonprofit organizations.

APPLYING FOR GRANTS AND LOANS

What you'll need for most grants or loans:

- An itemized list of losses with your estimate of the repair or replacement cost of each item.
- Copies of your federal income tax returns from the last three years.
- Copy of your deed, mortgage or renter's lease.
- Estimates of new flood insurance premiums; copies of your previous insurance policy or insurance settlement.

For personal loss:

- Proof of monthly income (stubs, statements).
- Driver's license and/or Social Security number.

Business or farm loss:

- A brief history of the business or farm.
- Personal and business financial statements.
- Loan repayment schedule; list of bills owed.
- Agricultural Stabilization and Conservation Service information on farm crop base and assigned yields.

Information from: University of Wisconsin Cooperative Extension, University of Illinois Cooperative Extension Service, University of Missouri Cooperative Extension, American Red Cross, Federal Emergency Management Agency

Surviving a Financial State of Emergency

STRATEGIES FOR FAMILIES AFTER A DISASTER

Disasters can create serious financial crises for families. Insurance may not cover as much as anticipated. Homes and jobs may be lost. Family members may be out of work due to injuries. In an ideal world, families have adequate cash reserves or credit to draw on for disasters. But reality is often far from ideal.

Making decisions about repairs and purchases, and developing resources to maintain your home can be difficult. However, some basic financial tools and household saving strategies can help you survive an emergency. In some cases, you may be able to make ends meet by making changes in the way money is handled every day.

FINANCIAL TOOLS

- *Cut back on current spending* as much as possible.
- *Use cash reserves* if you have them. When the emergency passes, rebuild your reserves.
- *Use unsecured credit,* such as a credit card, but use it wisely. Whenever possible, pay your balance in full to avoid finance charges. If you know that you will need several months to repay, consider taking out a loan rather than charging things on a credit card. Finance charges are likely to be lower for the loan than for the credit card. If you think you will be late making payments or you if have missed payments, contact your creditors immediately to make special arrangements.
- *Borrow against your assets.* If your home survived the disaster, you may be able to borrow against a portion of the equity through refinancing, a second mortgage or a home equity line of credit. Or you may be able to borrow against your equity in an employee pension plan or whole life insurance policy.
- *Liquidate assets.* You may want to consider selling major assets to generate cash. This will require making some difficult decisions about your priorities.
- *Discuss options for reducing interest charges on outstanding loans* with your creditors.

LOOK FOR WAYS TO SAVE

- Look at each monthly bill to see if you can make reductions and still keep the item or service. Telephone bills are a good place to start, especially if you have additional services that could be dropped temporarily, such as a second line or call waiting. Try lowering long distance charges by making fewer calls, shorter calls or calling when rates are lowest.
- Examine bills for cable TV, electricity, water and car maintenance for places to save. Utilities, such as the electric company, will help you with ideas to reduce costs, including use of balanced billing plans to even out expenses.
- Talk to insurance agents about ways to reduce costs. In some cases, deductibles can be raised, coverage lowered, life insurance converted to lower cost plans, or life insurance on children discontinued.

- Consider bartering. If you need repairs done in your home, consider exchanging your skills for the repair service you need. Some communities have bartering networks and groups, but you may be able to barter with a relative, neighbor or friend. Some examples are exchanging wallpapering for lawn mowing, fixing leaks for car repair, resume preparation for appliance repair.

LOOK FOR WAYS TO DO WITHOUT

- What things could you do without for a few months? Consider such overlooked expenses as newspaper or magazine subscriptions, hair care and/or beauty treatments, clothing, classes or lessons, sports leagues, nights out, vending machine snacks or buying meals at work.

- Learn nice ways to say no. It may be to a salesperson on the phone, a friend asking to do something that costs more than you care to pay, or a child saying, “Everybody has one.” Some easy ways of saying no are:

  a) “That's something we've decided not to buy right now.”
  b) “That's a great price, (product, offer, idea) but I'm afraid I have to pass for now.”
  c) “Let me think about it.”

To children, suggest, “That's something you can buy with your allowance,” or “Let's think of some ways for you to earn or save the money to buy it.”

- Shop less often and with a written list. Time spent in stores encourages spending money, especially when shopping trips are not essential. Take only as much cash as you can reasonably spend. Don't carry credit cards or ATM cards.

- Look for alternatives to making new major purchases. Borrow an appliance from a family member or friend. Or buy an inexpensive used model through the newspaper, a friend or a garage sale.

ADDITIONAL SOURCES OF INCOME

If physical damage to your home was minor, you might consider temporary room rental as an additional source of income. Be sure your local regulations and zoning laws permit room rental. Garage sales may be a good way to bring in extra cash if you have undamaged items that you no longer need. Consider a cooperative garage sale with family, friends or neighbors.

Additional resources:

Your county family living agent, your local emergency government office, the American Red Cross, the Federal Emergency Management Agency

Related publications:

UW-Extension publications–

“Managing Between Jobs — Deciding Which Bills to Pay First,” (B3459-3);

“Managing Between Jobs — Strategies for Spending less,” (B3459-2);

“Managing Between Jobs — Talking with Creditors,” (B3459-4);

“Making Ends Meet: Our Spending Plan,” (B7760313).

Information from: University of Wisconsin Cooperative Extension, Iowa State University Extension, University of Florida Cooperative Extension Service

Restructuring Debt After a Disaster

ESTABLISHING PRIORITIES AND ADJUSTING DEBT

You are obligated to pay all of your creditors, even after a disaster has shaken your financial status. However, debt adjustments can ease a difficult financial period by reducing the amount paid to creditors, or extending the time period for payments.

Before contacting creditors, take a hard look at your finances and evaluate how much and when you can pay. Consider:

- **Your monthly income**
- **Essential monthly living expenses**
- **Number of creditors and total amount owed**
- **How long your present financial circumstances will last**
- **Assets (savings, items that could be sold) that could help pay off loans**
- **High-priority debts**
- **Debts that could be satisfied by voluntarily surrendering, or giving back, an item**

DECIDING WHICH DEBTS TO PAY FIRST

If you can't pay all your bills, you must decide how much to pay to which creditors. One way is to divide available money and pay every creditor a share of what you owe. This is probably the fairest way, but it doesn't always work because each creditor must agree to reduce the amount they receive and extend the payment period.
Another creditor payment strategy involves setting priorities. Ask yourself these questions:

- *What will affect my family's health and security the most?* Usually the house, utilities, food, transportation and medical insurance take priority. Don't be tempted to let medical insurance slide when money is tight. If anyone in your family becomes ill, uninsured medical costs could be devastating. Pay high-priority bills or contact creditors at once to work out smaller payments.

- *What will we lose if the bills aren't paid?* You can lose your purchases if the creditor holds the title of the property as security for the loan: a home mortgage or car loan, for example. Sometimes furniture and large appliance loans are secured loans. If you aren't sure which loans are secured, check the credit contract. Unsecured debts may have to take lower priority, although you are obligated to pay them too.

- *How much do we still owe on the loan?* Determine how much you have paid on each loan and how much you owe. If you have only one or two payments to make on a loan, it's probably a good idea to finish paying it. Getting out from under some of your debts can reduce the pressure you feel. You may be able to return newer items or sell them to pay off the debt. If you choose to voluntarily surrender an item, you'll still be required to pay the difference between its market value and the amount remaining on the loan.

- *What interest rate are we paying?* Credit card firms charging 1.5% interest per month would receive 18% interest per year on the unpaid balances. If you have a loan with a lower interest rate, you may decide to pay off a higher interest credit card balance first, to reduce the amount of finance charges you are paying. Until your financial situation improves, watch credit card purchases carefully. Consider putting cards away in a safe place so you are not tempted to use them.

MAKING IT WORK

Remember — no matter how bad your situation may be, don't ignore your bills and creditors. Prompt action is very important; let your creditors know you are having trouble before you miss payments and the situation becomes worse.

♦ Once you have worked out a repayment plan, follow through with it and make the payments you promised to make. If you fall behind on your new commitments, creditors will be less understanding. If you fail to make the payments, creditors may hire a collection agency to make you pay.

♦ Openly discuss spending decisions with all family members. This will help everyone realize that changes and sacrifices must be made for your family's plan to be successful.

- *Is consolidation a good idea?* Personal finance companies want you to think so, but generally a consolidation loan charges a higher interest rate, often 20% or more. And refinancing to smaller monthly payments will extend the number of payments you must make, adding to the total cost. If you are facing a temporary financial crisis because of disaster, the ease of a single payment may be worth the higher interest rate if you can pay back the loan early with no penalty.

- *What about our credit record?* Nonpayment of debts is recorded on your credit record and can damage your ability to get credit in the future. That's why you should contact all of your creditors immediately if you cannot pay your bills.

YOUR REPAYMENT PLAN

Once you have calculated how much money your family has for monthly living expenses and for paying off debts:

- Decide how much you can pay to each creditor, based on priorities you determined while answering the previous questions.

- Work out a repayment plan that shows how much you plan to pay each creditor. Put this plan in writing.

- Contact each of your creditors to explain your family situation. You will need to tell them how much you are able to pay and when you will be able to pay it. (See the fact sheet, “Communicating With Creditors,” in this series.)

- Some businesses, such as utility companies, have counselors to help you budget even payments during the year. They also can tell you if you qualify for fuel assistance or any available programs.

Additional resources:

Your county family living agent, your local emergency government office, the American Red Cross, the Federal Emergency Management Agency

Related publications:

UW-Extension publications–

“Managing Between Jobs — Deciding Which Bills to Pay First, (B3459-3);

“Managing Between Jobs — Strategies for Spending less,” (B3459-2);

“Managing Between Jobs — Talking with Creditors,” (B3459-4);

“Making Ends Meet: Our Spending Plan,” (B7760313).

Information from: University of Wisconsin Cooperative Extension, University of Illinois Cooperative Extension Service, University of Florida Cooperative Extension Service

Communicating With Creditors

WHEN YOU FACE MISSING PAYMENTS AFTER A DISASTER

After a natural disaster, you may face temporary loss of income and steep bills for clean-up and repair not covered by insurance. If you realize you can't pay all your bills, it is important to face your debts and know how to talk to creditors.

Your past experiences with creditors are important. If you have consistently paid bills when due, your creditors will be more cooperative than if you were late or didn't make regular payments. Creditors want to keep your business, but as businesses they also need to be paid.

Contact your creditors immediately; don't wait for them to contact you. Explain your current situation. Tell them your family income is reduced and you are not able to keep up with your payments. Frankly discuss your future income prospects so you and your creditors can figure out solutions to the problem. Most creditors would prefer to receive smaller payments on a regular basis than to begin expensive collection procedures.

WHERE TO BEGIN

Before you and your creditors agree on a reduced payment or some other solution, determine how much money you have to pay off your debts. Figure out how much income you can count on each month and how much you need to pay for your essential monthly living expenses.

Once you have gathered this information, contact each creditor explaining your family's situation and work out a solution. Be prepared to explain:

- The reason you cannot pay.
- Your current income and prospects for future income.
- Other obligations.
- Your plans to bring this debt up-to-date and keep it current, including the amount you will be able to pay each month.

Visit local creditors in person. Contact out-of-town creditors by phone or letter. If you phone, write down the name and title of the person to whom you talked. Follow the conversation with a letter summarizing the agreement between you and the creditor. Keep copies of your correspondence as well as any replies.

As you negotiate with each of your creditors, don't agree to any loan simply to get off the hook. Be sure you will be able to follow through on the agreement. Establish a payment rate that is realistic and acceptable to both you and the creditor.

RENEGOTIATION OPTIONS

Here are some alternatives to consider when negotiating with your creditors:

- Reducing the monthly payment
- Refinancing the loan
- Consolidating your loans
- Deferring a payment for a short time if you expect your income will increase soon
- Reducing or dropping late charges
- Paying only interest on the loan until you can resume making monthly payments

WHEN THEY CALL…

If you receive a call from a creditor or a collection agency:

♦ Ask the name of the caller. Get the name of the creditor and the name, address and telephone number of the collection agency. Get the exact amount of the account that is claimed to be due. Write down the date and time of each call.

♦ Don't get angry. Remain calm in order to obtain the information noted above.

♦ Dispute debts in writing. If you believe you do not owe the amount claimed or disagree in other ways, make your reasons known promptly in writing to both the creditor and the collection agency. Request a written statement of your account.

Additional resources:

Your county family living agent

Related publications:

UW-Extension publications–

"Managing Between Jobs — Deciding Which Bills to Pay First," (B3459-3);

"Managing Between Jobs — Strategies for Spending less," (B3459-2);

"Managing Between Jobs — Talking with Creditors," (B3459-4);

"Making Ends Meet: Our Spending Plan," (B7760313).

- Voluntarily surrendering or giving back an item purchased on credit
- Selling the item and using the cash to satisfy, or partially satisfy, the debt (you are still responsible for any remaining balance)

Not all creditors will be willing to accept alternatives. However, they will be more likely to work with your family if you contact them before they contact you. If you fail to follow the plan that you and your creditor agreed upon, you may hurt your chances of getting future credit. Tell your creditors about anticipated changes that may affect your payment agreement.

IF YOU DON'T PAY YOUR BILLS

If you miss a payment, you will face increasing pressure to pay. First you will receive a letter reminding you that you missed a payment and asking you to pay promptly. After that, you may receive a more direct letter demanding payment, or you may get a phone call.
If the bills are still not paid, they will probably be turned over to an independent collection agency.

CREDITOR'S OPTIONS

Creditors can take several kinds of legal action against you if you fail to make payments:

- *Acceleration.* The entire debt is payable at once if you miss a payment. The courts can force you to pay by seizing your property and selling it.
- *Repossession.* The creditor can seize the item you bought or the property you used as collateral. If the sale of the property brings less than the amount you owe, you must pay the difference.
- *Wage garnishment.* A court order requires your employer to withhold part of your wages and pay your creditor.
- *Foreclosure.* The lender may start proceedings to take possession of your home/business and sell it to recover the remaining balance of the loan. You are responsible for the legal fees of foreclosure and the difference between the selling price of the property and the amount owed on the loan.

All of these actions are very serious and could jeopardize your ability to get credit in the future. To avoid such problems, work out solutions for debt repayment early and stick with the plan unless it is renegotiated.

Information from: University of Wisconsin Cooperative Extension, University of Illinois Cooperative Extension Service
University of Wisconsin-Extension • Cooperative Extension

Talking as a Family About Money

OPENING UP COMMUNICATION AFTER A DISASTER

No matter what damage a disaster leaves in its wake, the common denominator is often a money crunch. While money problems may seem too painful to discuss, they may only get worse if you don't talk about them.

Overcoming financial difficulties takes honest and candid communication. It also takes time and effort. Coming together as a family can help members, both young and old, work together to get through the difficult times. Children who are included in family decisions usually welcome the opportunity to figure out how they can contribute. Even a 4-year-old can help turn off lights to save on energy costs.

Additional resources:

Your county family living agent, your local emergency government office, the American Red Cross, the Federal Emergency Management Agency

Related publications:

UW-Extension publications–

"Managing Between Jobs — Deciding Which Bills to Pay First," (B3459-3);

"Managing Between Jobs — Strategies for Spending less," (B3459-2);

"Managing Between Jobs — Talking with Creditors," (B3459-4);

"Making Ends Meet: Our Spending Plan," (B7760313).

GATHER AS A FAMILY

When families work on financial issues together, the result is often new solutions and a new appreciation for the strengths and resources each member has to offer. Here are a few guidelines:

- Family members, including children old enough to understand, should be involved in decisions. Family members will be more satisfied with decisions if they have input.
- Remember that disasters bring with them a range of emotions. Each of you may be at different stages in dealing with losses and new hardships. Try to be calm, patient and supportive of one another.
- Set a specific time to have a family discussion. Choose a location where you won't be interrupted.
- Clearly identify the issue at hand. Don't drag other points into the discussion that don't address the problem, concern or dissatisfaction.
- Let each family member freely state his or her wants, needs and personal feelings. Avoid judging or criticizing.
- Be willing to negotiate for a realistic settlement of differences. In many cases, family members must compromise. Making a contract or written agreement may help avoid misunderstandings. Solutions also can be accepted on a trial basis, and changed if the results aren't satisfactory.

ONE THING AT A TIME

As a family, focus on ways to tackle one problem area at a time. During one gathering you might talk about ways the family can spend less money. At another session, tackle methods for record keeping as a way to control spending.

When discussing new purchases or services, ask:

- Can we do without it?
- Can we postpone it?
- Can we substitute something less expensive?
- Can we shop around for a better deal?
- Can we make or do it ourselves?

Information from: University of Wisconsin Cooperative Extension, Iowa State University Extension, University of Florida Cooperative Extension Service

Talking to Children About Money

GUIDELINES FOR PARENTS AFTER A DISASTER

Disaster-related financial stress can take a toll on young children, especially when parents are busy with day-to-day recovery and clean-up.

While children's complaints may seem trivial in light of other problems at home, they often signal the need to talk about why the family must cut spending. Each family has to decide how much to tell their children about the family's financial situation. If children know how the family stands financially, they can better cooperate with the family spending plan. They also can better handle their own money.

Additional resources:

Your county family living agent, your local emergency government office, the American Red Cross, the Federal Emergency Management Agency

Related publications:

UW-Extension publications–

"Managing Between Jobs — Deciding Which Bills to Pay First," (B3459-3);

"Managing Between Jobs — Strategies for Spending less," (B3459-2);

"Managing Between Jobs — Talking with Creditors," (B3459-4);

"Making Ends Meet: Our Spending Plan," (B7760313).

GET CHILDREN INVOLVED

Children can't help but be affected when the family cuts back on spending. So it makes sense that they are included in discussions about changes that will affect them.

- *Have family meetings to talk about money concerns.*

  a) Offer information that children can understand without overwhelming them.
  b) Encourage children to discuss their personal feelings and suggestions for handling the crisis.
  c) Avoid judging and criticizing.

- *Explain financial issues in terms your children can understand.* For example, you can tell your daughter that you aren't spending $100 to buy a new video game system because that same $100 is needed for family groceries. Help children learn they can't buy everything they want, and that there is a difference between what they want and what they need.

- *Find ways that your children can help the family cut expenses.* Children can learn to comparison shop if parents point out unit prices, store brands and generic brands. At home, they can help compare prices in advertising flyers from different stores. Even young children can learn to turn off lights and appliances to save on energy costs. Older children can choose "free" activities with their friends, like going for a bike ride or to a park or library, rather than going places where money is needed, like a shopping center, video arcade or roller skating rink.

- *Refer to your family as a team.* Agree that together you can get through these tough financial times.

Information from: University of Wisconsin Cooperative Extension, Iowa State University Extension

Income Tax Deductions For Property Loss

STEPS TO TAKE AFTER A DISASTER

Property losses from natural disaster are tax deductible. Such deductions, which are allowed for partial or total loss of personal or business property, could greatly reduce the amount of federal income taxes owed for the year the disaster occurred.

RECORDS

If you claim a theft or casualty loss resulting from a disaster you may be asked to show:

- The kind of disaster and when it occurred;
- That the damage was a direct result of the disaster;
- That you were the owner of the property;
- Your income tax basis in the property. In general, this is the original cost of the property plus the cost of any improvements before the loss, minus depreciation claimed for income tax purposes (for business and rental property);
- Fair market value before and after the disaster;
- Any insurance benefits or other compensation received including free repairs, restoration and clean-up from any disaster relief agencies.

Before-and-after photographs, receipts, canceled checks, deeds, purchase contracts and professional appraisals are good supporting evidence for casualty claims.

APPRAISAL

If either personal or business property has been damaged extensively, you should have the property appraised as soon as possible following the disaster. A professional estimate of value will serve as evidence for casualty loss claims. The fee charged is also a deductible item.

ITEMIZING TAX DEDUCTIONS

If you itemize your tax deductions, you may deduct casualty losses from fire, storm, theft or property destroyed by some sudden external force. However, you must reduce the deduction by any reimbursements or payments received to rebuild or restore property.

Specifically, homeowners can claim a casualty loss deduction for the difference between the fair market value of their property before the disaster and after, subtracting insurance proceeds (or other reimbursements they receive to rebuild or restore a home), 10 percent of adjusted gross income and $100 per disaster event. To document the before- and after-market value of your home, use the most recent assessed value from property taxes for the before-disaster market value and a current appraisal for the after-disaster market value.

If renters make repairs on the property or offer repayment for part of the loss, that too is considered reimbursement and must be subtracted to determine the amount of casualty loss that can be claimed. Grants or other gifts that are specifically designed to repair or replace property must be deducted as well. Homeowners who haven't received a reimbursement, but expect to, will be required to make an estimate of the reimbursement and subtract it. Those who find they overestimated their reimbursements can amend their casualty loss claim in another tax year.

HOW TO FIGURE DEDUCTIONS

The rules for figuring deductions on business or non-business property losses are the same.

Subtract the reduced market value after the disaster from the fair market value before the disaster. For example, on personal property:

Fair market value before	$75,000
Fair market value after	30,000
Reduction in value (Line 1 minus Line 2)	45,000
Income tax basis (the original cost of property, $40,000, plus the cost of any pre-disaster improvements, $15,000)	55,000
Casualty loss (lesser of Line 3 or 4)	$45,000

The casualty loss deduction is the lesser of the reduction in value or the income tax basis. In the above example, the casualty loss deduction would be $45,000.

If a business or income-producing property is completely destroyed by a casualty, special rules apply. In such cases, the loss is the income tax basis reduced by any salvage value, insurance or other compensation. If insurance is more than the income tax basis, a taxable gain results.

For more details, contact your local tax representative for advice on figuring these tax loss deductions. To file for casualty loss, use IRS Tax Form 4684 and request an instruction sheet.

Additional resources:

Your county Extension office; the Internal Revenue Service, (800) 829-3676 for forms, (800) 829-1041 for the Casualty Loss Department; your local emergency government office, the American Red Cross, the Federal Emergency Management Agency

Related publications:

IRS Tax Form 4684 and instruction sheet

Information from: University of Wisconsin Cooperative Extension, Pennsylvania State University Cooperative Extension Service, University of Illinois Cooperative Extension Service

Emotional Recovery After a Disaster

HOW FAMILIES AND NEIGHBORS CAN HELP ONE ANOTHER COPE

Disasters bring with them an incredible range of emotions, from disbelief and anger to a euphoric spirit of teamwork. Temporary homelessness, damaged personal items, lost crops and an uncertain future weigh heavily on survivors. Unfortunately, the need to talk about one's losses, fears and anxieties may be forgotten in the wake of clean-up efforts.

Mental health professionals have identified a number of post-disaster phases that survivors may experience, as well as guidelines for managing disaster-related stress. The most common coping tools are our abilities to listen, talk and actively support one another during this time.

PHASES OF DISASTER

It is important to recognize the emotional phases we may experience after disaster. There is often overlap between phases.

- *Historic phase.* This period usually occurs at the time of impact and in the period immediately after. Emotions are strong and direct. People find themselves being called upon and responding to demands for heroic action to save their own and others' lives and property. Altruism is prominent, and people expend major energy in helping others survive and recover. The most important resources during this phase are family groups, neighbors and emergency teams of various sorts.

- *Honeymoon phase.* This period generally extends from one week to six months after the disaster. For survivors, even with the loss of loved ones and possessions, there is a strong sense of having shared with others a dangerous, catastrophic experience and having lived through it. Supported and often encouraged by the influx of official and governmental staff who promise many kinds of help, the victims begin clean-up. There is anticipation that more help soon will be available. Pre-existing community groups and emergency community groups are especially important resources during this period.

- *Disillusionment phase.* This phase generally lasts from about two months to one or even two or more years. Strong feelings of disappointment, anger, resentment and bitterness may appear if failures occur and the promises of aid are not fulfilled. Outside agencies may need to leave, and some of the local community groups may weaken. Also contributing to this stage may be the gradual loss of the feeling of “shared community” as victims concentrate on rebuilding their own lives and solving their individual problems.

- *Reconstruction phase.* The survivors come to realize they will need to solve the problems of rebuilding their own homes, businesses, farms and lives largely by themselves and gradually assume responsibility for the tasks. This phase generally lasts for several years after the disaster. The appearance of new buildings replacing old ones, the beginnings of new construction and the development of new programs and plans all serve to reaffirm residents' belief in their community and their own capabilities. If these signs of progress are delayed, however, the emotional problems that appear may be serious and intense. Community groups with a longer-term investment in the community and its people become key players during this phase.

SUPPORTING YOUR FAMILY

♦ Tell family members when they have done a good job.

♦ Laugh! Laughter can help relieve tension.

♦ Be considerate of other family members.

♦ Express love and concern often.

COPING SKILLS

- *Let people give you a hand.* Take advantage of people who are willing and able to help. Volunteers may be available for sand-bagging or clean-up of debris. Relief agencies may offer food and cleaning supplies. The additional help can make a critical difference between coping and suffering.

- *Take care of your physical and emotional needs.*

  a) See that you and your family members eat a balanced diet to fuel your energy.
  b) Try to get enough sleep. Fatigue slows you down during an emergency and makes you prone to accidents and injury.
  c) Talk with others about your feelings and listen to theirs. Together, look for positives in the situation.

- *Be patient with one another.* Realize that when we suffer losses, it is natural to express disbelief, anger, sadness, anxiety and depression afterwards. Emotions will rollercoaster and moods can change suddenly. Spouses' viewpoints may vary considerably.

- *Don't overlook the feelings of children as you deal with the disaster.* They need to feel they can count on you for extra attention, love and support. Reassure them, making sure they understand they are not responsible for the problems you face (See fact sheet, “Helping Your Child Cope With Disaster”).

- *Refocus on the big picture, instead of little details and the little problems.* Don't expect things to instantly restore themselves.

- *Remember that a support network is essential.* In addition to family members and friends, you may wish to speak with clergy members and professional counselors. In some cases, you may need to refer a family member or friend for help (See fact sheet, “Identifying Stress in Family or Others”).

- *Show by words and actions that you care.* A friendly arm around troubled shoulders or a few words of support can help tremendously. Offer specific types of help or ask how you can help. Don't be afraid of saying or doing the wrong thing. And keep helping. Even small, kind deeds will mean a lot to others.

Additional resources:

Your county family living agent; Farmers Assistance Hotline (for Wisconsin farm families), (800) 942-2474; health and human service workers; clergy; school personnel; financial and legal assistance agencies; UW-Extension video “Managing During Tough Times,” (VB0052)

Related publications:

UW-Extension publications–

“Managing Between Jobs — Controlling Stress,” (B3459-11);

“Managing Farm Stress,” (B2744-1).

Information from: University of Wisconsin Cooperative Extension, Iowa State University Cooperative Extension Service, Kansas State University Cooperative Extension Service, University of Illinois Cooperative Extension Service

Identifying Stress in Family and Others

WHEN OUTSIDE HELP IS NEEDED AFTER A DISASTER

A feeling of helplessness is a normal reaction to a disaster. Personal coping methods like talking things out, accepting comfort and help from others, and taking things one day at a time help most people through the rough times. But when those methods fail, outside help may be needed. If you notice the warning signs of severe stress in a family member, neighbor or a friend, there are some things you can do.

SIGNS OF PROLONGED STRESS

When families or individuals are under stress for long periods of time they may experience a number of signs and symptoms. Watch for the following effects in people you see on a day-to-day basis.

- *Physical.* Headaches, ulcers, backaches, eating irregularities, sleep disturbances, frequent sickness, exhaustion.
- *Emotional.* Sadness, depression, bitterness, anger, anxiety, loss of spirit, loss of humor.
- *Behavioral.* Irritability, backbiting, acting out, withdrawal, passive-aggressiveness, alcoholism, violence.
- *Cognitive.* Memory loss, lack of concentration, inability to make decisions.
- *Self-esteem.* Comments such as, “I'm a failure,” “I blew it,” “Why can't I...?”

CRIES FOR HELP

The greater the number of signs or symptoms, the greater your concern should be. If someone is exhibiting the following signs of depression or suicide, it is important they get linked up with help as soon as possible. All cries for help should be taken seriously.
Signs of depression:

- *Appearance.* Sad face, slow movements, lack of interest in appearance.
- *Unhappy feelings.* Feeling sad, hopeless, discouraged, listless.
- *Negative thoughts.* “I'm a failure.” “I'm no good,” “No one cares.”
- *Reduced activity.* “Doing anything is just too much of an effort.”
- *Isolation.* “I don't want anyone to see me,” “I feel so lonely.”
- *Guilt and low self-esteem.* “It's all my fault,” “I should be punished.”

Signs of suicidal intent:

- *Anxiety or depression.* Severe, intense feelings of anxiety or depression.
- *Withdrawal or isolation.* Withdrawn, alone, lack of friends or supports.

MAKING A REFERRAL

♦ Call the agency and ask to speak to the intake worker (if there is one). Identify yourself and your relationship with the person or family.

♦ State what you think the person's or family's needs are (immediate protection from suicidal acts, an appointment for counseling.)

♦ Provide the agency with background information (name, address and phone; age and sex; nature of current problem or crisis; any past history you are aware of.)

♦ Ask the agency what follow-up action they will take. Find out when they will act on the referral, whom you may contact later, cost of the service, etc.

Make sure the person or family and the referral agency connect. Make one or more follow-up contacts with the agency if necessary.

Additional resources:

Your county family living agent; Farmers Assistance Hotline (for Wisconsin farm families), (800) 942-2474; health and human service workers; clergy; school personnel; financial and legal assistance agencies; UW Extension video "Managing During Tough Times," (VB0052)

Related publications:

UW-Extension publications–

"Managing Between Jobs—Controlling Stress," (B3459-11);

"Managing Farm Stress," (B2744-1).

- *Helpless and hopeless.* Sense of complete powerlessness, a hopeless feeling.
- *Alcohol or drug abuse.* There is often a link between alcoholism, drugs and suicide.
- *Previous suicide attempts.*
- *Cries for help:* Making a will, giving possessions away, making statements such as "I'm calling it quits."

FARM FAMILIES

Even without disasters, recent years have been difficult for farm families. Many are experiencing financial and emotional stress that is only heightened by disasters such as flood or tornadoes. There are several signs when a farm family may be in need of help. They include:

- *Changes in routine.* The farmer or farm family stops attending church or drops out of community groups.
- *Increase in illness.* Farmers or family members may experience more colds, flu, aches and pains.
- *Appearance of farmstead declines.* The farm family no longer takes pride in the way farm buildings and grounds appear.
- *Care of livestock declines.* Cattle may not be cared for in the usual way; they may lose condition, or show signs of abuse.
- *Increase in farm accidents.* The risk of farm accidents increases because of fatigue or loss of ability to concentrate.
- *Children show signs of stress.* Farm children may act out, experience academic declines or increased school absences; they also may show signs of physical abuse or neglect.

HOW TO REFER A PERSON FOR HELP

If you see signs that the person or family needs help that you can't provide (financial, legal or personal counseling), try to assess what agency or community resource would be most appropriate. Then discuss the referral with the person or family. You might say, "It sounds/looks like you are feeling____. I think ____ could help you deal with your situation."

Explore the individual or family's willingness to initiate contact with the community resource. Ask, "How do you feel about seeking help from this person/agency?" If they are unwilling to take the initiative or there is some danger if action is not taken, you should call an agency for assistance. (See sidebar, above left.)

Information from: University of Wisconsin Cooperative Extension; Health and Human Issues Department, UW-Madison/Extension
University of Wisconsin-Extension • Cooperative Extension

Helping Your Child Cope With Disaster

WAYS TO HELP CHILDREN DEAL WITH STRESS

Emotional support of children is very important during a disaster. If not addressed, a child's fears may continue long after the actual disaster has passed. Young children are particularly at risk during these times because of their deep sense of vulnerability, their lack of understanding and their difficulty in communicating how they feel. Older children are affected too. Like their younger siblings, they might find it difficult to express their feelings. They may be terribly frightened of how the disaster might affect their future.

Fortunately, parents and other adults can make a great difference in how children deal with stress. Your love and support can carry children over the rough spots. Initially, it helps to recognize some normal reactions that children may have to disaster. From there, you can take practical steps to foster understanding and support.

FEARS

It is normal for children to be afraid, especially with the uncertainty brought by natural disasters like a flood or tornado. The fear may last for an extended period of time and is best dealt with by kindness and understanding on the part of parents. Children should be encouraged to talk about their feelings and express their fears through play, drawing, painting or working with clay.

Children's fears vary according to age, maturity and previous learning experience. Four major fears common in children are: death, darkness, animals and abandonment. If they have experienced flooding, fire or tornado, children may have encountered several of these fears.

Fears may be intensified when adults back away from discussing the topic with children. Many families ban all painful topics from family conversation. A better approach is to openly talk with your children about their feelings.

WHAT YOU CAN DO

- *Talk with your child, providing simple, accurate information to questions.* This helps avoid the fear of the unknown.
- *Listen to what your child says and how your child says it.* Is there fear, anxiety, insecurity? Repeating the child's words may be very helpful, such as “You are afraid that...” or “You wonder if the flood will come again tonight?” This helps both you and the child clarify feelings.
- *Make sure children know the family's difficulties are not their fault.* Children tend to blame themselves for problems.
- *Reassure your child with statements such as “We are together. We care about you. We will take care of you.”* You may need to repeat information and reassurances many times.
- *Hold your child.* Provide comfort. Touching is important for children during this period. Close contact helps assure children that you are there for them and will not abandon them.
- *Involve children.* Let them help fill a sandbag or participate in a safe, simple clean-up activity. This helps them feel they are part of the family. It also helps them feel needed, appreciated and useful.
- *Spend extra time putting your child to bed.* Talk and offer assurance. Leave a night light on if that makes the child feel more secure.

- *Observe your child at play.* Listen to what is said and watch how the child plays. Children frequently express feelings of fear or anger while playing with dolls, trucks or friends after a major disaster.

- *Provide play experiences to relieve tension.* Work with clay and paint; play in water, etc. If children show a need to hit or kick, give them something safe like a pillow, ball or balloon. Allow a safe, open space for them to play if possible. If your child lost a meaningful toy or blanket, allow the child to mourn and grieve (by crying, perhaps). In time, it may be helpful to replace the lost object.

- *Contact a community resource such as your doctor, mental health agency or minister if you sense you need outside help for a child.*

- *Keep your sense of humor and enjoy a good laugh together frequently.*

- *Take care of your own emotions and stress.* Children will reflect your anxiety or your calm.

Additional resources:

Your county family living agent; Farmers Assistance Hotline (for Wisconsin farm families), (800) 942-2474; health and human service workers; clergy; school personnel; financial and legal assistance agencies; UW-Extension video "Managing During Tough Times," (VB0052)

Related publications:

UW-Extension publications–

"Managing Between Jobs — Controlling Stress," (B3459-11);

"Managing Farm Stress," (B2744-1).

Information from: University of Wisconsin Cooperative Extension, Kansas State University Cooperative Extension Service, University of Illinois Cooperative Extension Service, North Carolina Cooperative Extension Service

University of Wisconsin-Extension • Cooperative Extension

Hiring a Contractor After a Disaster

LOCATING QUALIFIED PEOPLE AND AVOIDING FRAUD

If your home has been damaged by a natural disaster, you are probably eager to have repairs made. But it is well worth your time to find a reliable contractor for the job. Most people start by asking friends, neighbors and colleagues for recommendations. Hardware stores, lumberyards, insurance agents and lending institutions may be able to recommend contractors as well. If your community is receiving disaster assistance, check with agency personnel for lists of contractors.

Always get a written contract for repairs, but don't be pressured to hurriedly sign it. Ask for references and check them out. If sub-contractors will be used, do the same.

GENERAL CONTRACTOR OR SPECIALIST?

If you need a variety of repairs, you may want to hire a general, building or remodeling contractor to coordinate the project. You sign one contract and the contractor arranges all the work, subcontracting with various specialists — like plumbers, masons or electricians.

Specialists often are available to work on a single type of repair such as: concrete, masonry, carpentry, drywall, insulation, painting, floor coverings, electrical work, plumbing, heating, roofing, siding, waterproofing, and fire and flood restoration.

DO YOUR HOMEWORK

When it comes to home repair, it's important to understand the options you have, as well as some of the terms contractors use. Some good sources of information include your county Extension office, disaster assistance center, lumberyard or local librarian. Also think about any home improvements that might be combined with repairs, such as modifications to increase energy efficiency or sump pump installation to prevent future basement flooding.

INTERVIEWING CONTRACTORS

Be prepared to have contractors approach you after a disaster. Make sure they are legitimate business persons. Are they registered with county authorities? Do they have a business card, brochure, letterhead and telephone number? Ask if they belong to any trade associations. For plumbers and electricians, ask to see their state license.

Write down a list of questions you want to ask each prospective contractor and interview at least three. Some possible questions include:

- *Does the contractor have a good reputation?* Ask for references from previous jobs and if you can see examples of past work. Ask where he or she plans to purchase materials and contact the supplier to see if bills are paid on time. Call the local building inspector, Better Business Bureau, Home Builders Association, Building Trade Council or chamber of commerce to see if any complaints have been filed against the contractor.

- *Does the contractor have appropriate insurance?* Contractors should have liability insurance and workers' compensation insurance. If not, you may be liable for accidents on your property. Ask the contractor for proof of current insurance coverage.

CONTRACT PROBLEMS?

If problems arise with a contract:

1) Try to resolve them directly with the contractor. Do this in writing so you both have a copy;

2) If you cannot resolve the problems, contact the Consumer Protection Office for Wisconsin at (800) 422-7128 or the Better Business Bureau at (800) 273-1002;

3) Contact the contractor's trade association. They may act as an intermediary or arrange arbitration.

- *Will the contractor provide a written estimate?* You should insist on a written estimate. The estimate usually will be in the form of a contract you can sign to hire the contractor. When comparing estimates, be sure that all bids are based on the same work. And if you plan to do some of the restoration work yourself, be sure to check with the contractor to see how this will affect warranties and the schedule.

Remember, the lowest bid is not always the best one. There may be a misunderstanding of the nature of the work being quoted, a mistake in the quote, poor quality workmanship being offered or use of low-grade materials.

QUESTIONS TO ASK REFERENCES

Call at least two contractor references. Here are a few questions to ask:

- Why did you decide to use this contractor?
- What work was done for you? Was it completed on time?
- Are you happy with the finished product?
- Did the workers keep the project area neat and clean?
- Was the work completed at the price stated in the contract?
- Would you hire this contractor again?

CONSTRUCTION CONTRACTS

Get a written contract. Oral contracts can't always be enforced.

- Include the building plans and/or specifications in the contract.
- Specify the start and finish dates to protect your interests, but realize that bad weather, unavailable materials or other problems may affect these dates.
- Include pay schedules for the work and itemized prices for the work. If you want special materials — for example, hardwood trim or top grade lumber — be sure this is specified.
- If possible, have a lawyer review all contracts and related documents before you sign.
- Don't make a large first payment, and don't pay for the project in full until work has been completed and inspected.
- Clearly state any warranties or guarantees on the work.
- Be sure both you and the contractor sign the agreement, with each of you keeping original copies.

Additional resources:

Your county family living agent

Related publications:

UW-Extension publication “Hiring a Contractor After a Natural Disaster,” December 1993.

“Home Improvement and Repairs,” Office of Consumer Protection, Wisconsin Department of Justice, June 1982.

Information from: University of Wisconsin Cooperative Extension, University of Florida Cooperative Extension Service

Site Selection When Building

HOW TO AVOID GROUNDWATER FLOODING

Groundwater flooding in homes is a common seasonal nuisance. Floors and walls may get wet, resulting in minor damages. In heavy rainfall years, high groundwater can become a much more serious and widespread concern as more homes are affected and the damage is greater.

The best time to think about groundwater flooding is before land is purchased or a home is built. Any site should be examined carefully to determine the potential for groundwater problems. If you have already selected a site with potential groundwater problems, you can ward off trouble with various construction modifications.

ASSESSING THE LAND

Get input from experts in the area of soils and groundwater when evaluating property for possible construction. Some good resources include county planning and zoning offices, the Soil Conservation Service, contractors with groundwater expertise, well drilling companies and UW-Extension offices.

A number of natural features of the land can be examined to determine whether the site is suitable for building:

- *Topography*. The land surface on and around the proposed building site can offer evidence of potential for groundwater flooding.

  a) Flat landscapes often have shallow depths to water tables, particularly in floodplains of rivers, streams or areas with numerous wetland features. When these areas are subject to extended surface water flooding, they also may experience flooding from rising groundwater.
  b) Hilly terrains do not guarantee freedom from groundwater problems. Depending on the nature of the bedrock underlying the soils and the characteristics of the soils, groundwater can be close to the surface on some slope locations. Seeps may form on slopes or near the base of slopes as the water table contacts the surface.

- *Vegetation* on or near a prospective building site can offer significant clues about the prevailing conditions of soil moisture and potential for groundwater problems. Some native trees such as black willow, black ash, silver maple, red maple, cottonwood, swamp white oak, white cedar and balsam fir are very tolerant of wet soils. Even if the property is not considered a wetland, the presence of pockets of wetland plants such as dogwood, viburnum or alder shrubs, and herbaceous species such as cattails, reed canary grass or bulrushes near the elevation of the building site may indicate high groundwater.

- *Soil characteristics* offer an opportunity to confirm suspected groundwater problems. Digging a soil pit to look at the soil profile can reveal evidence of maximum groundwater levels that may be well above the average position of the water table. Since basement excavations are typically in the 5- to 6-foot range, soil pits may not be practical without special equipment or the use of a contractor. Or, you might seek help from a soils expert.

more information ▸

NEW CONSTRUCTION CONSIDERATIONS

Perhaps you have already made a decision to build on a site with potential groundwater problems. Or perhaps potential problems became apparent after excavating began. Groundwater trouble still could be avoided by using several construction modifications.

- *House construction can be modified or designed to reduce the risk of groundwater flooding on a site.*

  a) One option is to reduce the depth of the excavation for location of footings. Fill is then added to the landscape to elevate the basement (or slab floor) above the anticipated maximum water table or groundwater level.
  b) Your contractor may recommend additional drain tile against the footings and basement walls. Drain tile may also be placed under the basement floor; the tile will facilitate drainage down a slope or accommodate a sump pump to relieve water pressure.
  c) The house design may be altered to minimize the need for full basement construction. This alternative requires less backfill to be hauled in to elevate the house. One design option, for example, is to use a bilevel or split level design, which does not require a fully excavated basement.

- *The septic system can be located and designed to reduce the chance of premature contact of septic waters with groundwater.* While testing of soils and percolation rates is required to obtain septic system permits, testing does not guarantee that a site will be free of groundwater flooding. The construction of mound systems in areas known or suspected of potential groundwater problems can be an option or requirement.

- *Well location should take into account the probable direction of groundwater flow.* This reduces the risk of having the well positioned "downstream" from the septic system or neighboring septic systems in the event of contact between septic drain fields and groundwater. Well casings can be positioned to reduce the risk of contaminated groundwater or ponded surface waters entering the well.

Additional resources:

Your county Extension office, the Soil Conservation Service, county planning and zoning offices, contractors, well drilling companies, Wisconsin Geological Survey

Related publications:

UW-Extension publications–

"Country Acres: A Guide to Buying and Managing Rural Property," (G3309);

"Removing Ground Water From a Basement of an Existing Home," December 1993;

"Hiring a Contractor After a Natural Disaster," December 1993.

"Land Buying Checklist," Home Builders Press, 4th Edition, 1990.

Information from: University of Wisconsin Cooperative Extension
University of Wisconsin-Extension • Cooperative Extension

Erosion Control When Building or Rebuilding

CONTROL PRACTICES FOR HOME SITES

If you are building or rebuilding following a disaster, make sure you and your builder are in compliance with local, county and state erosion control ordinances.

Erosion control is important because eroding construction sites are a leading cause of water quality problems in Wisconsin. Unless a builder uses erosion controls, about a dump truck and a half of soil washes into a nearby lake or stream for every acre under construction. The sediment problems eventually lead to higher taxes for waterway dredging and clean-up of streets, sewers and ditches; lowered property values for areas with sediment-damaged lakes or streams; poor fishing from muddy waterways; and nuisance growth of weeds and algae.

Except for new one- and two-family dwellings, local ordinances may be more strict than those from the Wisconsin Department of Industry, Labor and Human Relations (DILHR). They may also require erosion control on construction projects not affected by state or federal regulations.

EROSION CONTROL PLANS

The DILHR Uniform Dwelling Code is enforced for one- and two- family dwellings in most communities. The code requires that an erosion control plan be submitted with the building permit application to the local building inspector.

The erosion control plan must show:

- Location of the dwelling, other buildings, wells, surface waters and disposal systems on the site with respect to property lines.
- Direction of all slopes on the site.
- Location and type of erosion control measures.

CONTROLS REQUIRED

Erosion control is important even for home sites of an acre or less. The materials needed are easy to find and relatively inexpensive — straw bales or silt fence, stakes, stone, plastic tubes and grass seed. Additional controls may be needed for sites that have steep slopes, are adjacent to lakes and streams, receive a lot of runoff from adjacent land, or are larger than an acre.

Only a few controls are needed on most sites:

- Preserving existing trees and grass where possible to prevent erosion.
- Silt fence or straw bales to trap sediment on the downslope sides of the lot.
- Stone drive used by all vehicles to limit tracking of mud onto streets.
- Clean-up of sediment carried off-site by vehicles or storms.
- Downspout extenders to prevent erosion from roof runoff.
- Revegetating the site as soon as possible.

MAINTENANCE AND WASTE DISPOSAL

- Sediment controls must be maintained until the site is stabilized by mulching and seeding, sodding or landscaping.
- All building waste must be properly disposed to prevent pollutants and debris from being carried off-site.

ENFORCEMENT

Erosion control inspections will be made during other regular inspections (footing and foundation, rough construction, final, etc.)

- Violations must be corrected within 72 hours.
- Stop work orders may be issued for noncompliance.

Additional resources:

Your local building inspector or erosion control office, the Wisconsin Depart-ment of Industry, Labor & Human Relations, the Wisconsin Department of Natural Resources, your county Extension office.

Related publications:

UW-Extension publications–

"Erosion Control for Home Builders," (GWQ001);

"Standard Erosion Control Plan for 1 & 2 Family Dwelling Construction Sites," (GWQ001A).

Information from: University of Wisconsin Cooperative Extension, Wisconsin Department of Natural Resources and Department of Industry, Labor & Human Relations

Disaster Response

PRIORITIES AND RESOURCES FOR COMMUNITIES

Communities can either come together or unravel after a disaster. The difference is often the degree of focus, coordina-tion and communication among residents and leaders.

It helps if communities identify priorities for emergency response before a disaster occurs. Local government should be familiar with emergency resources within the community and what is available on local, state and national levels.

CONCERNS FOLLOWING IMPACT

Usually the most critical concerns following disaster impact include:

- Rescue of injured or endangered residents, removal of victims, evacuation
- Downed electric wires, power outages
- Leaking gas mains, ruptured chemical containers
- Containing and extinguishing fires
- Prevention of looting

RESPONSE RESOURCES

Beyond local government and emergency services such as police and fire departments, communities can look for assistance from the following resources:

- *Local emergency government.* Every county in Wisconsin is required by state statute to have an emergency government office and director in place. While larger cities may have local directors, smaller communities often have a critical need for the leadership and direction county emergency government can offer.
- *The American Red Cross.* Providing food and shelter to disaster survivors is a major thrust of Red Cross assistance, but assistance can also extend to back-up medical services, especially in smaller communities.
- *The state highway department* may be called in for rerouting of traffic and related concerns.
- *The National Guard* may be called in to prevent looting, help with sandbagging in a flood or any number of other measures involving manpower.
- *Declarations from the president.* Once a preliminary damage assessment has been completed by emergency response personnel, the state governor can request a major disaster or emergency declaration from the President of the United States:

    a) Declaration of an Emergency - The president can issue this declaration to supplement state and local effort to save lives and protect property. Total assistance provided may not exceed $5 million.

b) Declaration of a Major Disaster - After a natural catastrophe, assistance is offered to both public and private sectors through the Federal Emergency Management Agency (FEMA). Nearly 100 different programs and services help provide disaster relief.

OTHER RESPONSE CONCERNS

Once rescue concerns and other immediate dangers are taken care of, another level of activity needs to take place. Sometimes these concerns must be addressed upon impact.

- *Is the water safe to drink?* Testing for safe water should begin and continue throughout disaster recovery because of the chance of contamination from many different sources.

- *Sewers.* Chemical spillage needs immediate attention to prevent problems at the sewage treatment plant. In some cases the plant may be overloaded because of floodwaters.

- *Structural safety.* Are buildings and homes safe to enter? Professional building inspection is critical.

- *Hazardous materials.* All hazardous materials stored at commercial and other properties should be accounted for, from industrial chemicals to those used at drycleaners and gas stations. Spills can be a problem, and pressurized tanks could burst. Fire departments are required to keep an inventory of hazardous material locations.

- *Damaged trees, debris.* Debris is a major cause of injury during clean-up. Machinery should be brought in to help clear and dispose of wreckage. Some communities have brought in metal removers after a tornado to adequately clear farm fields for safe tractor use.

Additional resources:

Your local emergency government office, your local Extension agents, the American Red Cross, the Federal Emergency Management Agency

Information from: University of Wisconsin Cooperative Extension, Texas A&M University
University of Wisconsin-Extension • Cooperative Extension

Getting Local Government Back on Track

MEETING OPERATIONAL CHALLENGES AFTER A DISASTER

When disaster strikes a community, government leaders are under intense pressure to stay on top of recovery issues. Residents, business, government units and the media want answers and direction, even if emergency government has taken the reigns on emergency response efforts. If local leaders are among those affected by the disaster, getting government back on track can be especially difficult. But use of all available expertise and resources can ease the situation.

GENERAL GUIDELINES

- *Recognize there is often a delicate balance between emergency government and local government.* While emergency government has statutory authority for response efforts after a disaster, disagreements and resentments can occur unless there is cooperation, trust and ongoing communication between local and emergency officials. This is also true during the recovery phase, when the community has ultimate authority, but other agencies are still involved.

- *Discuss your community's recovery needs with state and U.S. representatives.* They can be a great asset in obtaining disaster assistance on the state and national levels. Recognize that you may be competing with other communities across the nation for assistance.

- *Take advantage of all available expertise and resources.* Your community will need help on a continuing basis for a long time after a disaster. Cooperative Extension specialists in the area of community resources can often help local leaders see the "big picture," find their way through the government maze, and utilize every available resource. These resources may include:

  a) local emergency government
  b) Cooperative Extension agents, including county agents and specialists from throughout the state
  c) state agencies, such as the Department of Natural Resources, the Department of Development and Department of Transportation
  d) the National Guard
  e) the Federal Emergency Management Agency
  f) the American Red Cross, the Salvation Army, churches and volunteer groups
  g) regional planning commissions
  h) temporary employees. Limited-term employees can be of great help to communities in the months following a disaster. Funding is often available through state or federal disaster relief agencies.

- *Balance the pressure to speed recovery with the need for planning and new growth within a community.* Getting local government back on track may mean new efforts to:

  a) Provide business counseling to local merchants that have sustained damage. The rebuilding period is an excellent time to re-evaluate business and make necessary improvements or changes in focus. Economic recovery can go hand in hand with disaster recovery.

b) Consider land-use and zoning changes that are long overdue.
c) Address aesthetic issues as business and residents begin rebuilding. These may cover architectural styles, colors, textures, size and height restrictions, and signage.

- *Don't ignore your own needs.* It's critical to keep a balance between your public duty and your personal life — especially if your home and family have been affected by disaster. It's not uncommon for leaders to spend all their time coordinating disaster efforts only to resign shortly afterward because they neglected their own concerns.

WORKING WITH THE PUBLIC

Community meetings can be an excellent way to get everyone moving in the same direction. However, it's better to hold meetings after the emergency response phase has passed and the community is out of danger. That way people can more calmly focus on recovery, clean-up efforts and their future. During the emergency phase, people need basic information about shelter, medical assistance, food and disaster relief. Radio and television announcements and relief workers can usually do the job most efficiently.

Drop-in centers for information on disaster relief are another good idea. Communities can use a municipal building, school, library or other public building to dispense information on everything from temporary housing and disaster loans to water-damaged basements. Relief agency representa-tives can be available to residents daily or weekly. Local officials should also be available on a regular basis to meet with residents.

Additional resources:

Your local emergency government office, your county community resource and development agent, the American Red Cross, the Federal Emergency Management Agency

Information from: University of Wisconsin Cooperative Extension
University of Wisconsin-Extension • Cooperative Extension

Planning and Zoning After a Disaster

IMPORTANT CONSIDERATIONS FOR THE LONG-TERM

Following a disaster, residents and business owners will be anxious to rebuild and in some cases relocate. This is a critical time for local government to assess issues of land use in terms of safety and long-term development concerns. Smaller communities may not have land-use plans or zoning ordinances. Training and assistance is often needed to begin using these tools after a disaster.

Larger communities usually have land-use plans and zoning ordinances, but they may need to be updated to reflect changing circumstances. And communities of all sizes may need assistance in handling the sudden surge in zoning permits and land-use proposals.

IMMEDIATE CONCERNS

- While local government needs to act quickly on issues of planning and zoning after a disaster, the long-term impact of each decision must be taken into account. This is an important principle to remember and discuss at public meetings when emotions are running high.
- Land-use plans and zoning ordinances are especially useful if there has been a great deal of destruction. They can provide the community with a blueprint for the future.
- Regional planning commissions or county zoning departments often can help train local officials in setting up land-use and zoning review boards.
- If a land-use plan exists, check to see that it is up to date. Check building codes, subdivision ordinances and ordinances on land-use and building. Communities with an office of planning or zoning may need to hire temporary staffing to help with an increased number of requests.

CONCERNS DURING THE REVIEW PROCESS

- Look for existing land-use conflicts. Examples might include machine shops within neighborhoods, bars next to churches or schools, and dangerous chemical suppliers or high-truck traffic in a downtown.
- Be wary of proposals that cause new land-use conflicts.
- Recognize there is a tendency to restore things immediately to the "way they were" without an eye to what makes sound, attractive community development.
- Special considerations need to be taken for properties located in flood zones. Communities may need to rezone areas, buy properties or use condemnation procedures. Sometimes rezoning a property to a "non-conforming use" can be helpful. This usually prohibits additions to property or repairs that are more than half the assessment value of homes.

Additional resources:

Your local emergency government office, your county community resource and development agent, the American Red Cross, the Federal Emergency Management Agency

Information from: University of Wisconsin Cooperative Extension

Aesthetics and Design Ordinances

HELPING GUIDE THE LOOK OF THINGS TO COME

A community will never look quite the same after a major disaster. Beautiful old trees may be lost forever. Some neighborhoods get facelifts, others may drift apart. Storefronts and cityscapes change. People are anxious to restore things to order, even if it's not possible to turn back the clock. The trouble is, hasty recovery efforts can leave a community with a hodgepodge appearance that no one ever intended. Worse yet, communities that weren't well-planned in the first place are sometimes all too successful in recreating the old look.

Design ordinances with a concern for appearance can make the difference. With them, you can help ensure that new and renovated structures are compatible with existing architecture. The purpose is not to lay down a long list of restrictions, but to help avoid potential eyesores or structures not in keeping with the character of an area. Typical concerns covered by ordinances include architectural style, texture and color, size and height, and signage.

GETTING SET UP

Try to set up a design review committee, if you don't already have one, early on in the recovery phase. From there you can discuss aesthetics concerns and how they can be reflected in design ordinances.

Committee training is important. You need smooth operations and review procedures to inspire confidence from fellow citizens. Help and expertise can come from your Extension community development agents, county planning agencies, private consultants and your regional plan commission. Committee members may be appointed from local representatives of government, but it's often a good idea to appoint citizen members as well.

- Begin with the notion that what's being built today in your community will last 70, 80 or 100 years. With that in mind, aesthetics become a weighty issue. This is a good time to discuss an existing or potential community theme.

- Try to build up and/or reflect community pride in your discussions and actions. Is the community known for its historical architecture, natural beauty, waterways, ethnic heritage, recreation, manufacturing history, or small town feel? What's important to the look or the character of place?

- Guard against a sterile look. It's easy to forget that the charm of older homes and buildings is often their multiple textures — the brick, wood, glass and surrounding trees and vegetation. Metal pole-frame buildings, new siding and strip malls may go up fast, but they won't generate the same warmth or interest.

- If historic preservation is a concern, get assistance from groups like the Wisconsin Trust for Historic Preservation and the State Historical Society. Remember that historic preservation extends to rural structures, including historically significant barns and outbuildings.

MAKING A CASE FOR AESTHETICS

Educating the public about aesthetic concerns is a major part of the committee's work. When people hear the words “design ordinances,” they may have fears about radical changes in the wind.

- Expect resistance through the review process. Meet it by listening to fears and concerns, and negotiating win-win solutions whenever possible.

- Try to use drawings, models and slides of what the community (or area of reconstruction) can look like. Consultants regularly provide these, but sometimes government planning agencies can assist as well.

- Realize that people take for granted that aesthetics will be the same when the community has recovered.

- Discourage incompatible mixes of architecture or building uses. At the same time, help businesses think about aesthetics and their image in the community. If businesses need to remodel or relocate, help them in their efforts; make them part of the big picture.

- Realize that you can't be too strict or people will have trouble with ordinances. Rejecting gaudy paint colors is one thing; specifying a palette of permissible colors may be a bit extreme for many communities.

- Be aware of typical aesthetic problems following a disaster:

    a) Temporary structures such as pole-frame barns or trailers can become permanent structures if communities aren't vigilant.
    b) Some people, including those on design review committees, rally around themes that may not be appropriate for a community. Choosing an ethnic or other unifying theme is a major decision that needs support from the community to be a success. What has worked in one community may not work for another.

- If the disaster was a major historical event for your community, consider ways of commemorating the disaster and those touched by it. You might incorporate a public display, memorial or cornerstone into a public building, park or other space. Such symbolic structures can be very powerful to a community's identity and emotional recovery.

Additional resources:

Your local emergency government office, your county community resource and development agent, the American Red Cross, the Federal Emergency Management Agency

Related publications:

UW-Extension publication “Community Growth Policy — Economic Impacts of Growth and Local Policy Choices,” (NCR079).

Information from: University of Wisconsin Cooperative Extension
University of Wisconsin-Extension • Cooperative Extension

Economic Development When Rebuilding

FOSTERING GROWTH AFTER A DISASTER

Communities should take a good look at economic development goals after a disaster. For various reasons, the time is ripe for planning. Building and relocation activity may be occurring at an unprecedented rate during recovery efforts. Business and private individuals may have available cash from property and insurance checks. Industry and businesses that were only marginally profitable before the disaster face major decisions about staying in business, relocating or changing direction.

To guide positive economic growth, communities should have economic development plans in place. Now is the time to review plans and update them as necessary. Small communities without such plans can get assistance from county development corporations or regional planning commissions. In addition to planning for private growth, communities need to be farsighted about public property replacement and improvements.

WHERE DO WE WANT TO BE?

Economic development is a process guided by both planning and unforeseen events, such as business closures, new industry or disasters. Communities need to assess current economic development conditions when disaster strikes. But they also need to ask, “Where do we want to be five, 10 and 25 years from now?” And “How do our decisions and assistance today affect the outcome?” Here are two guidelines to keep in mind:

- *Reassess economic conditions and existing development plans.* Discuss the history and direction of your community as you review public policy related to economic development. Re-evaluate economic development plans currently on the books — they may not reflect current goals or changed circumstances because of destruction.

- *If your community has no economic development plan in place, get assistance.* Don't work in a vacuum. Contact your local Extension office, your county development corporation or regional planning commission. All can offer expertise on retaining, expanding and attracting business and industry to your community.

REBUILDING GUIDELINES

- *Make sure you are not rebuilding mistakes.* Examine areas affected by disaster and consider how they fit into current economic development goals. Some industries may need to relocate to new or existing industrial parks. Likewise, some businesses may be better suited to business parks or other areas. Consider existing and potential traffic patterns. In some cases, roads may need to be rebuilt to suit changing needs.

- *Help local business and industry take advantage of disaster relief sources.* These may include private insurance, low-interest loan programs, grants and business counseling.

    a) Small business that was struggling to stay afloat before the disaster often can benefit from Small Business Development Center assistance. Business plans can be reviewed for viability and new plans established. Because businesses may have insurance checks in hand, this is an excellent time to consider improvements in retail space, location, production facilities and marketing.

b) Some businesses and industries will need to start up immediately after a disaster. The support of local government may be needed to streamline recovery efforts, including approval processes, and provision of utilities, transportation and communication.

- *Encourage timely rebuilding where feasible.* Remember that your community may lose tax revenue from structures that are not rebuilt within the year.

- *Keep disaster preparedness and mitigation in mind as rebuilding begins.* Some structures may need to be flood-proofed, raised or relocated. Tornado shelters and expanded warning systems are typical improvements after tornadoes. Fire prevention should be a concern as any structures are rebuilt.

Additional resources:

Your local emergency government office, your county community resource and development agent, the American Red Cross, the Federal Emergency Management Agency

Related publications:

UW-Extension publications–

"Community Economic Development Strategies," (G3366);

"Community Growth Policy — Economic Impacts of Growth and Local Policy Choices," (NCR079).

Information from: University of Wisconsin Cooperative Extension
University of Wisconsin-Extension • Cooperative Extension

Caring for Flooded Lawns

DAMAGE ASSESSMENT AND RESTORATION

Lawns usually survive being underwater for up to four days. But you may have to replace the lawn if floodwaters caused erosion or brought chemicals, contaminants or more than an inch of mud or silt.

Your major concern this growing season should be stabilizing the soil to prevent further sediment movement. Planting a temporary lawn is usually the best way to do this. Next year you can establish permanent grasses. While floodwater may cause new weed problems, keep in mind that some weed cover is better than no cover. Weeds help dry out soil.

WHEN THE LAWN IS UNDERWATER

Damage to your lawn will depend on many factors including duration of submergence, water depth, temperature, grass species, light intensity and condition of the grass prior to flooding. A few general rules:

- Grasses survive much longer at water temperatures below 60 degrees F. than at higher temperatures. But most grasses survive submergence at normal summer temperatures.
- Tolerance to submergence varies among grasses in the Midwest. Bentgrass has excellent tolerance, while Kentucky bluegrass, tall fescue and rough bluegrass have intermediate tolerance. Fineleaf fescue and perennial ryegrass generally have poor tolerance.
- As soon as possible after the water recedes, aerate the soil to a depth of at least three inches and lightly fertilize flooded areas. You can rent a mechanical aerator from your lawn and garden store or use a pitchfork. Areas submerged longer than four to six days may not survive and will require complete re-establishment (see steps in section on heavy silt deposits below).

DEALING WITH AN INCH OF SILT

Lawns submerged for less than four days and covered with an inch of silt or less have a good chance of recovery. To assist recovery:

- Wash as much silt as possible from the lawn using a garden hose.
- Use a steel tooth garden rake, a mechanical aerator or spiking equipment to break up the silt crust. Keep it broken throughout the growing season or until grass has become well established.
- Collect a representative soil sample and have it tested by your county Extension office for nitrogen, lime, phosphorous and potassium requirements. Agents can make recommendations on fertilizer and nutrients.
- If lawn recovery is spotty or generally thin, mechanically aerate the lawn four to six times in late summer or early spring. Then overseed with a desirable permanent seed mixture.

HANDLING EROSION

If your lawn's topsoil has been greatly eroded, replace it to a depth of 4 to 6 inches late in the growing season. If topsoil is unavailable or too expensive, you can improve existing soil by adding organic matter such as peat, rotted sawdust, manure or other materials. Apply these materials at a rate of 3 cubic yards per 1,000 square feet of lawn area and work them into the top 4 inches of subsoil. A temporary lawn, established immediately and later worked into the subsoil, can also be a source of organic matter.

DEALING WITH HEAVY SILT DEPOSITS

Lawns covered with more than an inch of silt may be heavily damaged, with only a slight chance of recovery. The degree of recovery will vary with grass species and depth of silt.
Re-establish the lawn as follows:

- If silt accumulation exceeds 3 inches, consider having silt removed professionally. However, it may be more practical to rototill the area, using the silt layer as a new topsoil and having it tested for nutrients.
- If silt is less than 3 inches, or has been removed to this depth, till the area, making sure the silt is mixed thoroughly and uniformly through the top 4 inches of the original soil.
- Take a soil sample of the new soil mixture after silt has been mixed in. Have the mixture tested to determine lime, phosphate and potash requirements.
- Retill after applying lime and fertilizer according to soil test recommendations.
- Reseed the area as you would to establish a new lawn. Seedings, especially of cool season grasses, should be made in early spring or late summer.

ESTABLISHING TEMPORARY LAWNS

- Where lawns must be completely re-established and immediate cover is needed, scratch the soil surface with a hand rake or similar tillage tool.
- Seed annual ryegrass at a rate of 4 to 6 pounds per 1,000 square feet.
- Till the ryegrass under at the appropriate time for re-establishment. Seed permanent grasses.

OIL AND CHEMICAL SPILLS

Soils may have been saturated with oil, herbicides or other toxic material. Petroleum will eventually decompose, but nothing can be done in the meantime to cancel its harmful effects. On large areas, bury oil deposits by deep plowing. On small areas, remove petroleum-soaked soil to a depth of 6 inches, and replace with new topsoil. Have a soil test taken; lime can often be added as a neutralizer. Reseed at the appropriate time.

Additional resources:

Your county agricultural agent, your local emergency government office, the American Red Cross, the Federal Emergency Management Agency

Related publications:

UW-Extension publications–

“Lawn Maintenance and Problems,” (A3435);

“Lawn Establishment,” (A3434);

“Sampling Lawn and Garden Soils for Soil Testing,” (A2166).

Information from: University of Wisconsin Cooperative Extension, Pennsylvania State University Cooperative Extension Service
University of Wisconsin-Extension • Cooperative Extension

Solid Waste and Contamination Concerns

GUIDELINES FOR COMMUNITIES AFTER A DISASTER

Solid waste management is critical to communities after a disaster. While the tendency is to clear major areas of debris first, identification and control of hazardous materials should take priority. Without these efforts, human life and the environment may be threatened. Potential hazards include contamination of public and private water supplies, fire, explosions, toxic releases into the atmosphere, chemical contamination of properties and waterways, and direct exposure to unsuspecting residents or emergency response teams.

HAZARDOUS DEBRIS

- *Notify local emergency government officials.* Depending upon the hazard potential of released materials, teams of trained hazardous materials specialists may be called on site immediately. Control and containment of hazardous materials will be the first priority. Appropriate state and federal authorities should be notified as well.

- *Identify areas of hazardous materials and potential contamination.* Facility site plans are good sources of public information for any public, agricultural or commercial facilities that house significant quantities of hazardous substances. Required by the Emergency Planning and Community Right-to-Know Act of 1986, these plans are filed on-site and with the local fire department, Local Emergency Planning Committee (LEPC) and State Emergency Response Board (SERB). Plans identify community hazards ranging from underground fuel tanks and pesticide storage areas to toxic cleaning solvents, manufacturing wastes and explosives.

- *Evacuate any areas where hazardous materials may cause harm.* If necessary, rope off areas to keep people out and place warning signs signifying the danger.

- *Contact appropriate state agencies, such as the Department of Natural Resources and Wisconsin Department of Agriculture, Trade and Consumer Protection.* They offer technical guidance on clean-up regulations and options for managing hazardous materials. Options may include landfilling, incineration or chemical treatment.

- *Segregate hazardous from nonhazardous substances in all levels of clean-up.* Stress the importance of segregating materials to residents involved in home clean-up activities, as well as recovering businesses, manufacturers and farmers. Consult state officials to determine local hazardous material collection options.

NONHAZARDOUS DEBRIS

County landfills and other licensed solid waste disposal facilities are the logical sites for nonhazardous solid waste after a disaster. However, in some cases, special one-time disposal sites may be available for commu-nities or individuals. This was the case for the community of Barneveld, Wisconsin, following the 1984 tornado that caused major destruction. A one-time disposal facility was established in a local quarry.

One-time disposal facilities must be approved by the State of Wisconsin, in accordance with Wisconsin Administrative Code regulation NR 502.12. State inspection, reporting and operational requirements must be met, including a design capacity not to exceed 10,000 cubic yards. Restrictions include a maximum site life of six months, well monitoring, and provisions for closure and ongoing inspection.

Procedures for nonhazardous debris collection after a disaster differ for residential, commercial and rural areas. Consult with regulatory officials regarding collection requirements and disposal options. Be sure you obtain necessary regulatory approvals before taking action.

Additional resources

Your county emergency government office, the Department of Natural Resources, the Wisconsin Division of Emergency Government, your county Extension office

Information from: University of Wisconsin Cooperative Extension
University of Wisconsin-Extension • Cooperative Extension

Water Contamination in Private Wells

REPAIR, CLEAN-UP AND DISINFECTION

Wells that have been overtopped by floodwater pose a number of immediate dangers, from electrical shock to serious water-borne illnesses. Therefore, do not turn on your pump after flooding has occurred and do not drink or wash with well water. Your well and pump need to be inspected after a flood. Your well also needs to be properly disinfected and its water tested for safety.

WELL AND PUMP INSPECTION

Swiftly moving floodwater can carry large debris that could loosen well hardware, dislodge well construction materials or distort casing. Coarse sediment in the floodwaters could erode pump components. In some cases, floods may cause some wells to collapse. For all these reasons, you should have professionals inspect your system.

- *Electrical system.* Do not turn on the equipment until the wiring system has been checked by a qualified electrician, well contractor or pump contractor. If the pump's control box was submerged during the flood, all electrical components must be cleaned and dry before electrical service can be restored. Get assistance in turning the pump on from the well or pump contractor.

- *Pump operation.* All pumps and their electrical components may be damaged by sediment and floodwater. The pump, including the valves and gears, needs to be cleaned of silt and sand. If pumps are not properly cleaned and lubricated they can burn out. Get assistance from a well or pump contractor who can clean, repair and maintain different types of pumps.

- *General cleaning of drilled, driven or bored wells.* To avoid damage to the well, have the contractor remove mud, silt and other debris from around the well top. If excessive mud, silt or sediment has entered the well, the pump may need to be removed before cleaning can take place.

- *Dug wells.* Do not attempt to disinfect or use a dug well that has been flooded.

PUMPING THE WELL

After the contractor services and cleans the well, pump it until the water runs clear to rid the well of floodwater. Depending on the size and depth of the well and extent of contamination, pumping times will vary. If the water does not run clear, get advice from the county or state health department or Extension service.

EMERGENCY DISINFECTION

After flooding, a well must be disinfected to kill bacteria and other potential disease-causing organisms. Wells that are less than 50 feet deep may be contaminated even if there is no apparent flood damage. The following steps apply to drilled, driven or bored wells only. Disinfection should not be attempted for dug wells.

- *Follow the instructions above for pumping the well.*

- *Prepare a chlorine solution.* Approximately 8 quarts of 5.25-percent (or 5 quarts of 10 percent) chlorine bleach such as Hilex, Clorox, etc., should be mixed with 100 gallons of water. It is best to prepare more solution than the amount of water standing in the well; if this amount is unknown, the 100-gallon measure is a safe estimate. Most garbage cans hold 30 gallons or more; therefore, filling three (clean) cans with the solution is sufficient.

- *Pour or pump the solution in the well in one continuous flow.* Attach a hose to a faucet and, making certain the hose itself is clean, place the other end of the hose into the well. Open the faucet and recirculate the chlorinated water for one hour, washing down the inside of the casing and pump piping. Faucets in your house should be opened until you detect a chlorine smell, then close them.

- *Allow the chlorine solution to remain in the well and piping for at least 24 hours, preferably longer.* The system should then be purged free of chlorine. Since it can disrupt a septic system, the chlorinated water should be run outdoors, perhaps into a ditch. It may kill grass and shrubs, and should not be run into a lake or stream.

SAMPLING AND TESTING

Once all flooded wells have been disinfected, wait one week to have the water sampled and tested by a state-certified laboratory or health department. Do not drink the water until two consecutive tests come back safe.

- If the laboratory issues sterile bottles for sampling, carefully follow all instructions for their use.

- If the test comes back unsafe, redisinfect.

- If the test comes back safe, retest in two weeks.

Unfortunately, your well may not be a safe source of water for months after extensive flooding or high groundwater. Wastewater from malfunctioning septic tanks or chemical seepage can contaminate the groundwater even after water was tested and found to be safe. You need to take long-range precautions, including repeated testing, to protect the safety of drinking water. Keep in mind that even under normal conditions, all private wells should be tested annually.

Additional resources:

Your county Extension office, the Wisconsin Department of Natural Resources, the Wisconsin Department of Health and Social Services

Related publications:

UW-Extension publications–

“Drinking Water Contamination: Understanding the Risks,” (G3339);

“Maintaining Your Home Well Water System,” (G3399);

“Home Water Safety,” (G3558, 1-5). DNR publication, “Bacteriological Contamination of Drinking Water.”

Information from: University of Wisconsin Cooperative Extension, Environmental Protection Agency, the Wisconsin Department of Natural Resources